Plane Tree Arboricultural Assessment

Incorporating Tree Valuations

BYRON & OTHO STREETS, INVERELL

Town Centre

Prepared for Concerned Inverell Ratepayers' Association

Prepared 14 March 2016

by

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Executive Summary

This report has been prepared for the Concerned Inverell Ratepayers' Association (CIRA), to provide an Arboricultural assessment of the Plane trees in the Inverell town centre within the area identified at **1.3 The Site** (page 5), and provide recommendations for the sustainable management and maintenance of the trees, including any remedial works to trees and/or infrastructure required, and options for incorporating the trees into streetscape upgrades.

The Arboricultural Assessment identifies a total of one hundred and thirteen trees (113) in the study area, including sixty three (63) Plane Trees. A full assessment has been carried out on a representative sample of twenty six (26) of the Plane Trees. Also identified were forty (40) Chinese Pistacio, seven (7) newly planted Ornamental Pear, one (1) Kurrajong, one (1) Liquidambar, and one (1) Japanese Maple. Refer to the **Tree Survey Information** table **and Tree Location Plans** (Appendix I & II) for details of individual trees.

The twenty six (26) trees assessed include 21 trees in the road bitumen, 22 trees in paved verges, 9 trees in open soil or grassed verges, 6 trees in raised planters in the bitumen, 4 trees in raised planters in the verge, and 1 tree in a verge garden.

All of the Plane Trees were considered to have Retention Ratings of 'Priority for Retention' or 'Consider for Retention'.

The Useful Life Expectancies (ULE) of the 26 assessed trees are as follows.

- No trees with less than 5 years (Remove) ULE
- One (1) tree with 5 to 15 years (Short) ULE (Tree 1)
- One (1) tree with 10 to 25 years (Short to Medium) ULE (Tree 38)
- Four (4) trees with 15 to 40 years (Medium) ULE (Trees 13, 44, 47, 48)
- Fifteen (15) trees with 30 or more years (Medium to Long) ULE (Trees 8, 10, 14, 15, 16, 19, 20, 21, 31, 32, 33, 39, 52, 53, 54)
- Five (5) trees with 40 or more years (Long) ULE (Trees 2, 6, 11, 12, 51)

The proposed streetscape upgrade as illustrated in part, in the 'Typical Main Street Treatment' plan would require removal of most of the street trees. This is considered to be an unacceptable outcome for the Urban Forest and the amenity and value of the town centre. There are no arboricultural reasons for the removal of most of the trees, and options exist for managing and retaining the trees. Alternative designs should be developed, in coordination with an AQF Level 5 qualified Arborist with experience in incorporating existing trees into streetscape design, to retain most or all of the trees and result in a net increase in canopy cover.

Contents

1. Introduction

1.1 Purpose

This report has been prepared for the Concerned Inverell Ratepayers' Association (CIRA), to provide an Arboricultural assessment of the Plane trees in the Inverell town centre within the area identified at **1.3 The Site** (page 5), and provide recommendations for the sustainable management and maintenance of the trees, including any remedial works to trees and/or infrastructure required, and options for incorporating the trees into streetscape upgrades.

The general purpose of Arboricultural Assessment of street trees is:

- To provide specific, objective Arboricultural information to inform better decision making in relation to street tree assets, and
- To recommend and detail best practice practicable measures to manage trees for the most beneficial outcomes for all stakeholders.

1.2 Brief

New Leaf Arboriculture has been engaged by the Concerned Inverell Ratepayers' Association to undertake an analysis of the existing trees within the town centre of Inverell and to assess the impact of Council's proposed streetscape works on the existing street trees, particularly the Plane Trees. The brief given was:

We seek the services of an arborist to provide us with information, regarding the efficacy of the London Plane trees. We do not envisage or perceive this as entailing a peer report. Rather the expectation is, that this will result in an independent report. We envisage that the process will encompass the following:

- *A meeting at commencement with CIRA reps*
- *An on-site inspection*
- *An assessment (from ground level) of a representative sample of trees.*
- *An assessment of the trees' height, canopy spread, form, health and condition*
- *An assessment of the existing strategies (if any) to manage and maintain the trees*
- *An assessment and recommendations for processes by which the trees can be more effectively maintained and managed.*
- *An assessment of the environmental and/or landscape significance of the trees*
- *An assessment of the notional value (if any) of the Plane trees.*
- *A summary of infrastructure conflicts where there is visual evidence of damage*
- *An analysis of the above information to identify which trees are either a priority for retention, considered for retention, considered for removal, or a priority for removal*
- *Alternatives to the removal of the trees where such alternatives could offer similar benefits and be considered practically achievable and financially reasonable*
- *A provision of 3 copies of the report in bound format and an electronic copy on disk.*

1.3 Declaration

I have no prior association, private or professional, with the Concerned Inverell Ratepayers' Association or any of its members, and my advice is provided without bias, and according to the professional Code of Ethics (IACA) under which I provide my consultancy services.

1.4 The Site

The site consists of the length of Byron Street between Otho and Wood Streets, and the length of Otho Street between Byron and Henderson Streets. Most of the site is within the local Heritage listed Inverell CBD Conservation Area ('C004' in Inverell Local Environmental Plan).

The vegetation in the locality is a mixture of planted trees, which are primarily deciduous exotic species, with a semi-formal avenue of Plane Trees making up the bulk of the tree cover, and smaller trees including Chinese Pistacio which are generally located at the street intersections. Seven juvenile Ornamental Pears have recently been planted in renewed garden beds in various locations.

Underground utility services are located within the footpath alignment, installed in the mid-1990s to allow for tree planting within the carparking section of the roadway (Moran, G. pers. comm.) and avoid interactions between tree roots and services.

Figure 1 - The Site (study area) shown highlighted - Byron Street and Otho Street, Inverell. Map source: SIX Maps, NSW Government, accessed March 2016.

1.5 The Trees

The Arboricultural Assessment identifies a total of one hundred and thirteen trees (113) in the study area, including sixty three (63) Plane Trees. A full assessment has been carried out on a representative sample of twenty six (26) of the Plane Trees. Also identified were forty (40) Chinese Pistacio, seven (7) newly planted Ornamental Pear, one (1) Kurrajong, one (1) Liquidambar, and one (1) Japanese Maple.

Refer to the **Tree Survey Information** table **and Tree Location Plans** (Appendix I & II) for details of individual trees.

It is understood from documents related to the streetscape upgrade, and discussions with members of CIRA, that the Plane Trees planted in the 1990s were planted inside concrete pipes, which were intended to reduce the spread of roots. This method is discussed further at section **4.7** (page 12).

2. Background

2.1 Best Practice Tree Management and the Urban Forest Approach

Urban Forest management is the current world best practice approach, which refers to a holistic view of all vegetation, public and private, native and exotic, trees and understorey, as part of the *urban forest* which provides the many benefits of having vegetation in developed areas. The Urban Forest approach goes beyond the maintenance and replacement methodology which has often been used in dealing with trees that overlooks the majority of trees' lifecycles. It also requires recognition of trees as *green infrastructure*.

Tree managers (those with care, control and management of land containing trees) should aim for managing the whole life cycle of tree populations. This approach optimises the useful life expectancies of trees, as well as minimising the adverse interactions that can arise from insufficient planning and management of trees and other assets which affect or are affected by them. This requires understanding of trees' growth and survival needs, an appreciation of all of the benefits arising from trees, and proactive planning for sustainable tree retention.

Good tree management utilises a variety of input, including arboricultural assessment, tree valuation, tree risk assessment, cost/benefit analysis, and strategic planning. Some of the current best practice methods and management practices for trees include:

- Net increase in canopy cover as a strategic goal
- Succession planting to avoid loss of canopy cover
- Proactive strategic planning, including a suite of Strategic Plans, legislative controls including LEP and DCP documents, tree management procedures and guidelines

New technologies and methodologies for monitoring and managing tree populations include:

- GIS mapping – yearly aerial images allow broad overview of tree canopy coverage, and analysis of changes over time for population and individual trees or areas;
- Scheduled, proactive management using Asset Management databases;
- Large scale tree assessment / monitoring, via "streetview" type imaging, or via gathering of baseline data by AQF Level 5 qualified arborists;
- Valuation of tree populations, such as iTree or similar;
- Tree management and Urban Forest management strategies and plans developed by qualified Arboriculturists;
- Urban Forest policy to increase overall canopy coverage over specified time;
- Street Tree Masterplan to identify appropriate species and locations;
- Upfront investment in trees to reduce future costs.

2.2 Benefits and Costs of Street Trees

The costs associated with trees are often easier to see and account for than the benefits that trees provide.

Some of the tangible benefits of trees are: increasing the lifespan of bitumen roads and paths by $225 per square metre of shaded bitumen (Moore, 2009), visual amenity, social value, human health, shade, economic values, increased property values, tourism, stormwater uptake, oxygen, habitat, biodiversity, carbon sequestration and many more.

The graph in Figure 2 illustrates that the majority of value and benefits derived from a tree's lifespan occur during its maturity, which is also when the costs associated with tree maintenance are lowest. Benefits are maximised where investment in tree maintenance has been ongoing.

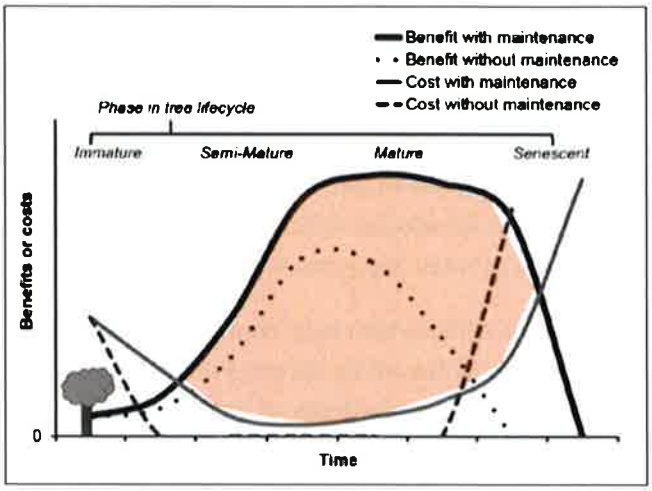

Figure 2 - Graph of costs and benefits of tree maintenance over time. Source: Vogt et al, 2015.

2.3 Tree Management Controls

Inverell Local Environmental Plan 2012 (LEP) includes clause *5.9 Preservation of trees or vegetation* which states:

1) *The objective of this clause is to preserve the amenity of the area, including biodiversity values, through the preservation of trees and other vegetation.*
2) *This clause applies to species or kinds of trees or other vegetation that are prescribed for the purposes of this clause by a development control plan made by the Council.*
   Note : A development control plan may prescribe the trees or other vegetation to which this clause applies by reference to species, size, location or other manner.

3) *A person must not ringbark, cut down, top, lop, remove, injure or wilfully destroy any tree or other vegetation to which any such development control plan applies without the authority conferred by:*
   a) *development consent, or*
   b) *a permit granted by the Council.*

5.9AA Trees or vegetation not prescribed by development control plan states:

1) *This clause applies to any tree or other vegetation that is not of a species or kind prescribed for the purposes of clause 5.9 by a development control plan made by the Council.*
2) *The ringbarking, cutting down, topping, lopping, removal, injuring or destruction of any tree or other vegetation to which this clause applies is permitted without development consent.*

The Inverell Development Control Plan 2013 does not define prescribed trees, but refers to "mature trees" and "significant trees" as items which should be preserved, retained and incorporated into development. Inverell Council currently has no tree management documents. There is a 'Tree Planting Guide for Inverell Shire' listing species suitable for planting in Inverell LGA.

2.4 Site History & Town Heritage

The main town centre of Inverell is a local heritage listed Conservation Area with wide streets and many heritage buildings, and the tree plantings are a notable feature of the main streets. The Plane Trees along Byron and Otho Streets are a formal planted avenue of public trees. Twelve (eighteen including Evans Street median) of these trees were planted in the 1950s, possibly in relation to the statewide Jubilee tree plantings. The 1990s planting continued the theme of avenues of Plane Trees.

While trees in Inverell have never been subject to a Tree Preservation Order, there have been multiple "generations" of tree plantings and trees have been a consistent part of Inverell's streetscape during its history.

2.5 Soil Type and Climate

The soils in the area are clay with basalt parent material. The local average climate includes annual rainfall of around 800mm and average temperatures of 10-23°C.

3. Tree Assessment Methodology

3.1 Limitations and Assumptions

The recommendations in this report rely on the provided information, including architectural plans (listed in **section 5.4**).

Care has been taken to obtain all information from reliable sources; however the author makes no representations, guarantees or warranties as to the accuracy of information provided by others. Similarly, no warranties are made as to the accuracy or completeness of any reproduction of this report. This report is only valid in its entirety and for the purpose for which it was prepared.

Conditions on the site may change after the tree assessment. Liability will not be accepted for damage or injury as a result of unforeseeable events or natural processes.

This report does not constitute or include a tree risk assessment. Where defects are noted, these are recommended for further investigation where warranted. Other tree defects may be present which have not been noted.

This report has been prepared without reference to any Council records or documentation about the current or past tree management practices, and as a result, tree damage may have occurred in the past which the author is unaware of.

3.2 Tree Assessment

Visual tree assessment was carried out by Jacki Brown, Arboricultural Consultant in February 2016. The tree inspection was limited to a visual assessment from ground level, without excavation, coring, drilling, or climbing. Trunk diameters were measured using a diameter tape, crown spreads were paced out on site, and tree heights were estimated by eye.

All photographs are taken by the author except where stated otherwise.

3.3 Tree Survey Data

The following explanations relate to the **Tree Survey Information Table** (Appendix I).

Tree Type indicates the location type where the tree is growing – Bitumen Road (B), Bitumen Raised Planter (BR), Verge Garden (VG), Verge Open Soil or Grass (VO), Verge Raised Planter (VR), or Verge Paved (VP).

Useful Life Expectancy (ULE) ratings are given for each tree, of either Long (40+ years), Medium (15-40 years), Short (5-15 years) or Remove (less than 5 years). The ratings are estimates based on the assessed health, condition and structure of each tree at the time of assessment, in its specific location. The ratings are not static, and may be revised during future assessments if conditions change.

Significance ratings are given for each tree, based on their Amenity Value, Ecological Value, size and location. While High significance trees provide substantial values to their surroundings, Low and Medium significance trees also contribute to the Urban Forest and in many cases may grow to become High significance trees, given the opportunity.

An ***Amenity Value*** rating of High, Medium or Low is assigned to each tree based on attributes such as shade, privacy, aesthetics and contribution to the landscape.

An ***Ecological Value*** rating of High, Medium or Low is assigned to each tree, based on species and potential habitat values, however this should not be taken as ecological advice.

Nominal ***Tree Protection Zones (TPZ)*** and ***Structural Root Zones (SRZ)*** are shown for each tree, calculated in accordance with the Australian Standard *AS4970-2009 Protection of trees on development sites*. The radius measurements are to be used as guidelines only, in coordination with an AQF Level 5 Arborist.

A ***Retention Rating*** has been applied to each tree based on Significance and ULE of: Priority for Retention (PR), Consider for Retention (CR), Consider for Removal (C-), or Priority for Removal (P-).

3.4 Reference Documents

The following documents were referred to in the preparation of this report:

- Aerial Photography: SIX Maps, NSW Government, accessed February 2016.
- Arborist Report: *Tree Report,* Ref. No. CD1108, 23rd April 2012, prepared by Mark Hartley, The Arborist Network.
- Arborist Report: *Tree Report,* Ref. No. CD1108, 20th July 2015, prepared by Danielle Austin and Mark Hartley, The Arborist Network.
- *Inverell Town Centre Renewal Plan (Draft)* and Appendices A, B, D and F, Ref. 5617_ TownCentreRenewalPlan_V5, January 2014, prepared by King & Campbell Pty Ltd.
- *Plane Tree Damage Photos,* Inverell Council.

3.5 Thyer Method Tree Valuation

The Thyer Method of Tree Valuation has been selected for use, as it is one of the industry accepted methods of assigning a nominal monetary value to trees, with regard to trees' values in economic, ecological, and social terms. A standard method of tree valuation has not yet been established, and variation in values does occur between assessors. The Thyer Method does not encompass all known values of trees, and is therefore a conservative estimate. Peter Thyer's published list of additional values is included in Appendix III.

3.6 Analysis of Streetscape Design Plans

The streetscape design concept plans and documents have been reviewed in relation to the tree canopy cover existing and proposed.

4. Arboricultural Assessment Findings

4.1 General Findings

The Plane Trees are generally in good health and condition, considering their constrained planting conditions and the presence of Sycamore Lace Bug. However, the trees are currently in inadequate space, with superfluous paving, bitumen and other items within their immediate surroundings reducing their available soil volume. Some of the trees have a history of poor pruning, and a few have had vehicle impacts to their trunks.

4.2 Summary of Tree Observations

There were sixty three (63) *Platanus x acerifolia* (London Plane) trees identified. This includes 21 trees in the road bitumen, 22 trees in paved verges, 9 trees in open soil or grassed verges, 6 trees in raised planters in the bitumen, 4 trees in raised planters in the verge, and 1 tree in a verge garden.

Eighteen of the sixty three identified Plane Trees are 1950s plantings, and the remaining forty five trees are 1990s plantings. Four of the 1950s plantings are in bitumen, the six in Evans Street are in open soil/grass in the median, and the other eight are in raised planters.

Twenty six (26) of the Plane Trees were assessed via a full Visual Tree Assessment

All of the Plane Trees were considered to have Retention Ratings of 'Priority for Retention' or 'Consider for Retention'.

Of the 26 assessed trees, the Useful Life Expectancies (ULE) were found to be:

- No trees with less than 5 years (Remove) ULE
- One (1) tree with 5 to 15 years (Short) ULE (Tree 1)
- One (1) tree with 10 to 25 years (Short to Medium) ULE (Tree 38)
- Four (4) trees with 15 to 40 years (Medium) ULE (Trees 13, 44, 47, 48)
- Fifteen (15) trees with 30 or more years (Medium to Long) ULE (Trees 8, 10, 14, 15, 16, 19, 20, 21, 31, 32, 33, 39, 52, 53, 54)
- Five (5) trees with 40 or more years (Long) ULE (Trees 2, 6, 11, 12, 51)

The following main observations relate to the Plane Trees:

- Some trees have a history of poor pruning, three of the Plane Trees have been topped very recently.
- Trees within the bitumen roads have bitumen entirely surrounding their trunks, leaving no permeable ground surface.
- Some minor infrastructure interactions were observed.
- There appears to be either different *Platanus* species, or genetic variation of *Platanus x acerifolia* in the study area, some of which appear more resilient to Sycamore Lace Bug.

The trees were found to have a range of management and maintenance requirements.

- Pruning – planned and prioritised
- Alteration of surrounding elements – including reducing pavers and bitumen and providing permeable surrounds
- Soil improvement
- Trees 44 and 48 have cavities which should be subject to arboricultural monitoring, and may warrant further investigation.

4.3 Pruning Practices

The majority of the trees within the study area have been correctly pruned, with crown raising of lower branches being the most common pruning practice. Some trees have low foliage which should be crown raised for pedestrian and vehicle amenity, i.e. where foliage hangs below 3 metres above ground.

However, the historically planted Plane Trees on Otho Street between Evans and Henderson Streets (Trees 39-51) have been lopped or pollarded in the past, and their crowns consist of regrowth from the lopping points. It appears that these trees have been intended as pollarded trees, however they have been cut back to beyond previous years' pruning points, which is not correct pollarding. These trees will need regular monitoring for defects and maintenance pruning, however it is not necessary to continually lop or pollard the trees. Pruning could be restricted to reduction of defective or overweighted branches where identified by a qualified Arboriculturist (AQF Level 4 or 5).

Three trees near the roundabout at the intersection of Otho and Henderson Streets have recently been severely lopped. These trees are at a "gateway" point of the highway and the incorrect pruning has reduced their landscape amenity, as well as their value. Their estimate value prior to pruning was approximately $14,000 each, and current value after pruning is approximately $6,000 each, using the Thyer Method (Refer to Appendix III).

Lopping and topping of trees is not an acceptable practice, as it increases the maintenance and costs associated with trees, and also increases the risk of branch failure due to the poor attachment of regrowth and depletes the tree's energy stores.

4.4 Insufficient Area Provided for Trees

All trees within the Inverell CBD have had their growing spaces reduced over time, with bitumen covering the root zones of trees in the road reserve, paving area and metal rings too close to trees' trunks within the verge planting areas, and vehicles damaging tree trunks by parking too closely to trees.

The trees in bitumen road areas have constrained growing conditions, due to the limited air, water and nutrients available to the trees' roots. They are generally in good to average health and condition. Bitumen has been installed up to the trunks of the trees, and over the top of surface roots in some cases.

Trees in paved areas also have constrained growing conditions. Many of the trees had insufficient permeable area provided around trunks in paving.

Trees in grass or bare soil verges were generally in good health and condition.

Raised planter beds have been built up around the existing trees in some areas on Otho Street. These planters have provided some permeable surface area around the trees, however they are of insufficient size to provide the trees' required soil volume. Upon inspection of the contents of one of the raised planters, layers of loose bitumen and gravel were found under the mulch, which reduces the water infiltration to the soil, and reduces available soil volume around the trees.

4.5 Road Maintenance

Bitumen has been laid on top of roots, with no opening in the bitumen around trunks, providing no permeable surface area around each tree. Roots increase in diameter during normal tree processes and this will continue to displace bitumen which is placed over the woody surface roots.

4.6 Infrastructure Interactions

Minor infrastructure interaction between trees and other features were observed, namely small cracks in kerb and guttering, and slight lifting of pavers. Most footpaths are in good condition. Where new trees have been planted, the openings in the paving have been increased – this could also be done around the existing Plane Trees.

4.7 Trees Planted in Concrete Pipes

The Plane Trees planted in the 1990s were planted inside concrete pipes, in an attempt to restrict the spread of roots. It was observed that roots have grown over the top of these pipes in some cases, and roots have extended beyond the pipe around all of the trees. The trees appear structurally sound, and have developed structural root systems. The exact structure of the root systems is unknown and should be investigated and recorded in the event of any future tree removal, to inform tree management practices of remaining trees.

4.8 Tree Valuation

Trees are an appreciating asset, and valuation is generally an underestimation. Ten of the assessed trees were selected as representative of other trees of similar size, condition and context, and a valuation of each was completed using the industry accepted Thyer Method of tree valuation. A valuation of one tree on Evans Street was completed as a comparison of a large, healthy Plane Tree with relatively adequate growing conditions.

4.9 Sycamore Lace Bug

All of the Plane Trees were affected by Sycamore Lace Bug to varying degrees at the time of inspection. There are treatment options for these insect pests, however the primary priority should be improvement of the trees' growing conditions, before attempting artificial treatment.

4.10 Poisoned Tree

Tree 1 was observed to have three round holes around the base of its trunk, consistent with drill hole size and shape. Three vertical strips of necrotic wood arise from the areas surrounding these three holes, consistent with herbicide application to those areas of the tree's tissue. The tree has dieback of parts of the upper crown, which is also consistent with tree poisoning.

The tree is showing moderate wound reaction wood at the edges of the necrotic areas.

The reduction in condition of the tree due to being poisoned, has reduced its value from $10,200 to $7,617, calculated using the Thyer Method (refer to Appendix III). Further dieback as a result of the poisoning may further reduce the tree's value.

The precedents which exist for situations of tree poisoning, include prosecution of the party responsible for the poisoning; installation of prominent signage on the tree or in place of it advising that the tree has been poisoned; replacement planting; or where the tree dies – leaving the dead stump in situ. A strong policy about tree poisoning should be developed and publicised.

4.11 The Proposed Streetscape Design

It appears that the proposed design of the streetscape upgrade works would involve the removal of most of the street trees. In the section of the 'Typical Main Street Treatment' shown below, between Vivian and Otho Streets on Byron Street, all of the 11 Plane Trees, 7 of the 10 Chinese Pistacios and 2 recently planted Ornamental Pear trees would be removed. The design shows replacement tree planting in this section to include 4 Pin Oaks (shown with crown spreads of approximately 11 metres, whereas the 'Street Tree Species Sheets' lists Pin Oaks as having a spread of 8 metres after 20 years), retention of 3 Chinese Pistacio trees, and planting of 9 small deciduous trees (also shown with larger crown spreads than described).

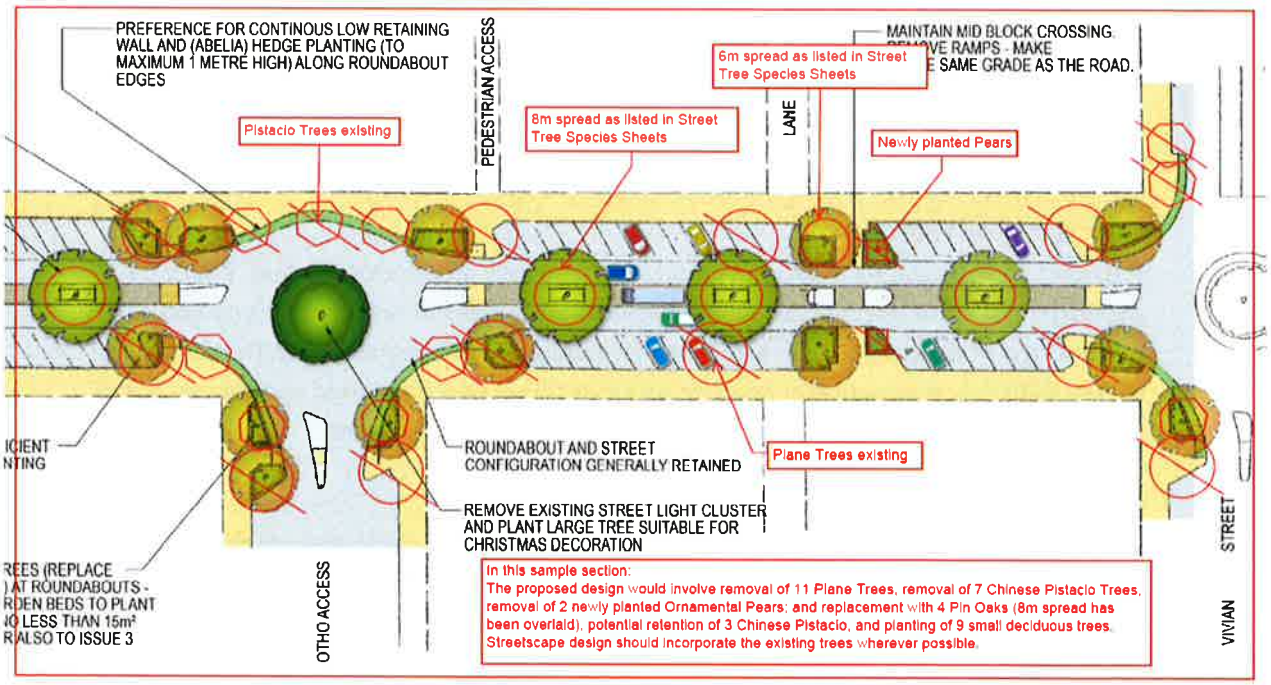

Figure 3 - Markup by New Leaf Arboriculture of the 'Typical Main Street Treatment' plan, King & Campbell (2014).

The main observations of the proposed streetscape design are:

- The design would entail removal of most of the existing trees, and this is considered to be unnecessary.
- The plan doesn't adequately replace the amenity and other values that would be lost as a result of the tree removals within the proposed design.
- The outcome would be a net loss of canopy cover.

- The large trees in the centre of the road will shade the road, but not the car parking areas or the pedestrian walkways.
- The median does not appear to be designed as a Water Sensitive Urban Design (WSUD) feature, i.e. the road camber sloping towards the centre, which could provide multiple benefits of watering the trees, reducing stormwater runoff, and improving water quality.
- The sustainability of the Pin Oak planting in the median should be assessed with consideration of the installation and maintenance costs compared to the benefits the trees will provide, particularly if the Plane Trees are removed.

5. Discussion of Tree Management Requirements

5.1 Best Practice Management of Existing Trees - Practical

Lack of proper maintenance and management of trees increases costs in the long term and reduces benefits provided by the trees. The following practical measures should be prioritised in sustainably managing the Plane Trees.

REMOVE OBSTRUCTIONS: Trees require a certain amount of physical space for the growth of their stems, roots and in some species, root buttresses, as well as foliage and branches. Where trees have outgrown the openings in paved and bitumen areas, future paving upgrades should be designed to provide larger spaces around these trees (e.g. a minimum of 4mx4m), which may be infilled with permeable surfaces such as Terrabond or similar, or maintained as mulched or underplanted garden beds. Where possible, structures, footings and services should be routed away from trees.

SOIL IMPROVEMENT: The trees would benefit from soil improvement works, to increase air and water penetration to deeper layers of soil, and also add organic matter and nutrients required for tree health, as well as improve the tree's resilience to drought, pest or disease attack, and other stressors. Vertical mulching is one option for providing soil improvement to existing mature trees.

INCREASE PERMEABLE AREA: A larger space in paving or bitumen around the trees will go some way in improving the trees' growing conditions, however a larger area of permeable ground surface beyond the tree opening would allow for ongoing tree health and growth by replenishing soil moisture.

TRAFFIC MANAGEMENT: To reduce future damage to trees, as well as to vehicles – provide sufficient setbacks where angle parking abuts tree plantings. Garden beds with shrubs or grasses would discourage carparking too close to the trees, reducing likelihood of impacts to trees.

REMOVAL AND REPLACEMENT: Where a tree nears the end of its life expectancy, or has an irreparable structural defect, removal and replacement is warranted. Species selection should be from a comprehensive list of trees suitable for use in streetscape situations (which should be developed).

FURTHER INVESTIGATION OF TREE STRUCTURE: Where significant structural defects are evident, further investigation may be warranted, such as sonic tomograph or Resistograph.

FUTURE WORKS TO AVOID ROOT DAMAGE: Future works should be planned, designed and constructed with regard to the location of existing tree roots in the vicinity.

5.2 Best Practice Management of Existing Trees - Policy

In addition to these practical measures, a hierarchy of tree management measures should be adopted by Inverell Council, namely staff and/or contractors to develop and administer tree management, strategic plans, policies, plans, procedures and guidelines including a Tree Management Plan.

Develop **TREE POLICIES**, particularly a definition of prescribed trees to be protected by the DCP, which recognise the different values, functions and requirements of CBD street trees as compared to trees on rural or residential properties.

STAFF FOR TREE MANAGEMENT to develop and administer tree management policies and procedures, increase public awareness, and manage tree related issues. Operational staff or contractors involved in tree works should be qualified in Arboriculture, to ensure proper pruning and other maintenance and management tasks are in accordance with best practice. Roads, engineering and planning staff should also be familiar with tree management principles to allow appropriate planning to reduce impacts on trees – Australian Standards AS4373 and AS4970 should be understood and followed.

The appropriate qualifications for tree related work are:
Pruning and removing trees – AQF Level 3 Arborist
Specifying pruning, providing advice and treatment for tree health – AQF Level 4 Arborist
Detailed Arboricultural assessments, reports, management advice and specifications, supervision of works near trees, and peer reviews of reports – AQF Level 5 Arborist
Academic research – AQF Level 8 Arborist

TREE MONITORING AND MANAGEMENT SYSTEM, which may be a proprietary system operated by either Council or contractor, or an in-house database connected to Council's asset management system. There are also participatory / citizen forestry programs available, such as iTree, which give the community tools to be involved in tracking the condition and value of public trees. Monitoring of trees should consist of arboricultural assessment of defects, branch defects, pruning requirements, mulch, and other problems and interactions requiring intervention as well as tree planting opportunities.

A **TREE MANAGEMENT PLAN** should be prepared for Council by AQF5 Arborist with access to records of pruning, root pruning, works in TPZs – root damage shown in Council's photos include damage to structural roots which can destabilise trees. Assign Maintenance Priority ratings for each recommended management or maintenance task, based on arboricultural assessment.

TREE RISK: Industry accepted methodologies for Tree Risk Assessment exist, two of which are TRAQ and QTRA, which give risk ratings based on specific arboricultural details about the tree, and on its surroundings including potential targets. The Risk Assessments need to be carried out by a qualified Arborist, who has been trained in the method. Tree removal based on fears or unsubstantiated claims of risk, is not appropriate tree management.

5.3 Best Practice Tree Pruning

The Australian Standard *AS4373-2007 Pruning of amenity trees* was first developed in 1996 to reflect best practice arboricultural knowledge about the best methods of pruning trees. The notable points covered by AS4373 are:

- Lopping, topping and extreme crown raising are unacceptable methods of pruning.
- Pruning work should be carried out by qualified Arborists.
- Pruning should occur at branch collars, and methods should be in accordance with the Standard.

Incorrect pruning creates additional unnecessary maintenance requirements, increases cost and risks, and reduces the value, amenity, environmental and other benefits provided by the tree, and is also likely to reduce trees' useful life expectancy. The trees which have previously been lopped don't necessarily need to be continuously pruned, however they should have monitoring and some reparative pruning.

Poor pruning (lopping) was observed to be a current practice around Inverell. This should be ceased immediately, with pruning carried out by qualified Arborists to repair and maintain the town's trees in accordance with best practice. It is not clear that crown pruning significantly reduces root growth – root management should be done directly and in coordination with an AQF Level 5 Arborist.

The following types of pruning are commonly required, and arboriculturally acceptable pruning methods.

CLEARANCE PRUNING: Pruning away from roadways, pedestrian paths, buildings, signage, other structures and sight lines. This pruning should be done to AS4373 and only to the extent necessary for clearance of the item. Extreme pruning is counterproductive as it encourages excessive amounts of epicormic regrowth, which is faster growing and therefore needs to be pruned more often.

SCHEDULED PRUNING: General maintenance pruning, including deadwood pruning, formative and clearance pruning only where required. Exact pruning extent needs to be assessed prior.

REDUCTION PRUNING: Reduction of selected branches, usually to reduce the crown weight above a specific defect. Should **not** be utilised as a whole tree treatment for healthy trees of normal form and structure.

DEADWOOD PRUNING: Pruning of deadwood of diameters greater than 50mm.

PRUNE DAMAGED BRANCHES: Removal to the nearest healthy branch collar, of a damaged branch where the branch is not capable of compensating for the damage.

FORMATIVE PRUNING: Pruning of young trees to create a framework of branches, removing any crossing or conflicting branches, and gradually crown lifting.

5.4 Tree Root Behaviour and Soil Volume

As stated in the 'Tree Report' (Hartley, 2012) previously prepared for Council, the pressures exerted by roots "are not generally sufficient to lift heavier structures with most structures over several tonnes being relatively unlikely to be damaged by tree roots". Therefore, the main streetscape features likely to be damaged by tree roots in Inverell are paving and other surrounding minor landscape elements.

Tree roots take the path of least resistance. Roots need access to water, oxygen and nutrients to survive and grow, and roots grow from the tips – the parts which absorb water, oxygen and nutrients are at the tips. Meanwhile the woody roots which are generally closer to the trunk expand in diameter as the roots grow. If permeable area around a tree is sealed, the roots which still have access to water, oxygen and nutrients (such as those that have reached a grass nature strip, or those growing in a join between hard surfaces) will be relied upon by the tree to survive and continue to grow.

Trees rely on their roots to live, and can't exist without roots. A minimum soil volume, and minimum permeable space around trees needs to be provided for the long term viability of the tree, but also to minimise the spread of roots into unwanted areas where roots have been able to access air, water and nutrients.

There is scope for the trees' permeable areas to be increased within their existing locations, to create greater setbacks to hard surfaces – this is evident where new *Pyrus* trees have been planted into enlarged garden openings in the paving, with repaired kerb and guttering. If concerns regarding tree root damage to buildings or other structures are justified (based on root investigations adjacent the buildings), the trees are located far enough from the buildings that root barriers are a viable option, and should be investigated in coordination with an AQF Level 5 qualified Arborist with experience in providing practicable solutions for retaining trees within streetscape upgrades.

5.5 The Existing Trees and the Proposed Streetscape Design

The current best practice approach to planning of streetscape works, in relation to trees is to incorporate the existing trees, where they are in good condition and worthy of retention in arboricultural terms, rather than proposing a carte blanche or blank slate approach, which would in effect dispose of valuable and appreciating assets. As noted in section 2.2, trees provide most of their value and benefits during maturity, whereas the planting and establishment stage and the end of life stage are the most expensive and provide least benefits. Removing healthy, mature trees is an unnecessary expense. Also considering the challenge of finding tree species that will thrive in street situations, removing successful trees should be tempered with consideration of other management options.

The following diagrams illustrate the difference between existing tree canopy in the section assessed (Figure 4), tree canopy after 20 years with the proposed streetscape (Figure 5), and alternative options for the streetscape: retaining existing trees and removing the median planting (Figure 6) or retaining existing trees and adding median planting (Figure 7).

The coverage areas shown are approximated based on average crown spreads of 9m for the *Platanus*, 7m for the *Pistacia*, 8m for the *Quercus* and 6m for the *Pyrus* (at maturity) and 2m for the existing *Pyrus* plantings.

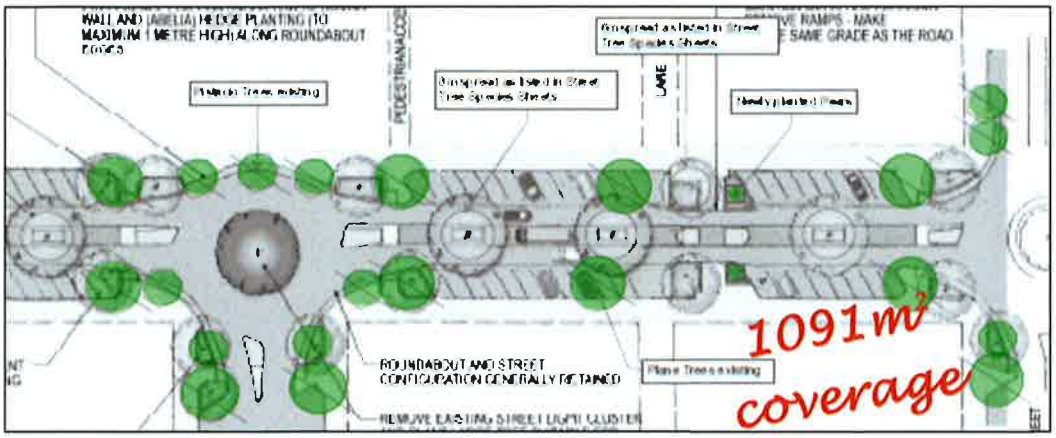

Figure 4 - Existing canopy cover - Byron Street between Otho and Vivian Streets

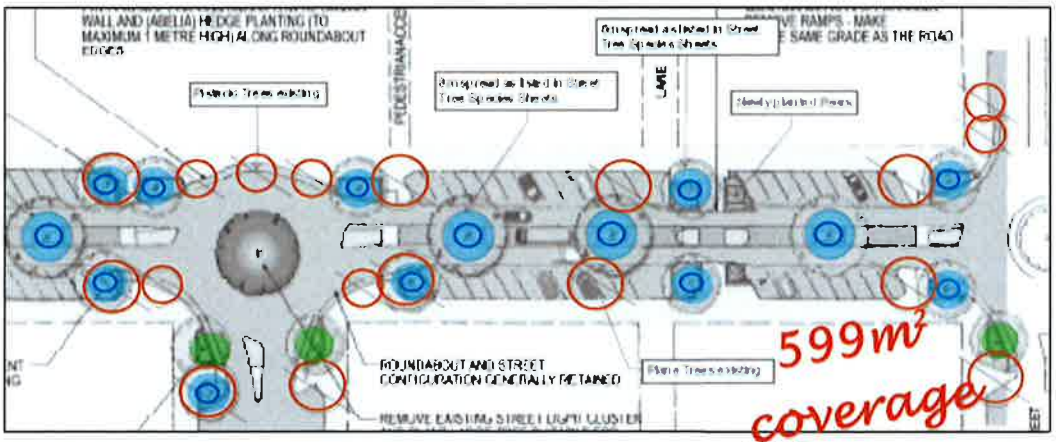

Figure 5 - Proposed canopy cover after 20 years (current design) showing immediate canopy loss proposed (orange ring), proposed trees planting (blue circle) and approximate size of trees at time of planting (blue ring) - Byron Street between Otho and Vivian Streets

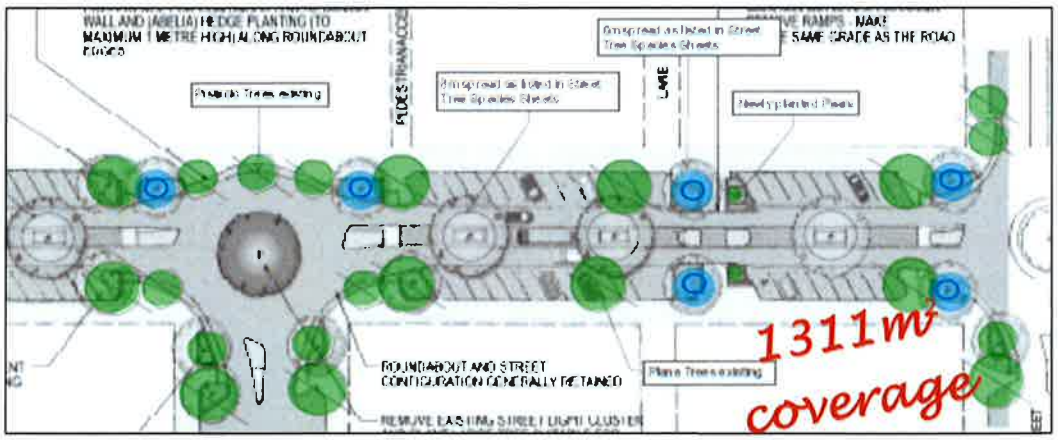

Figure 6 - Option with retained *Platanus* trees, additional verge planting, with no median planting (canopy cover after 20 years) - Byron Street between Otho and Vivian Streets

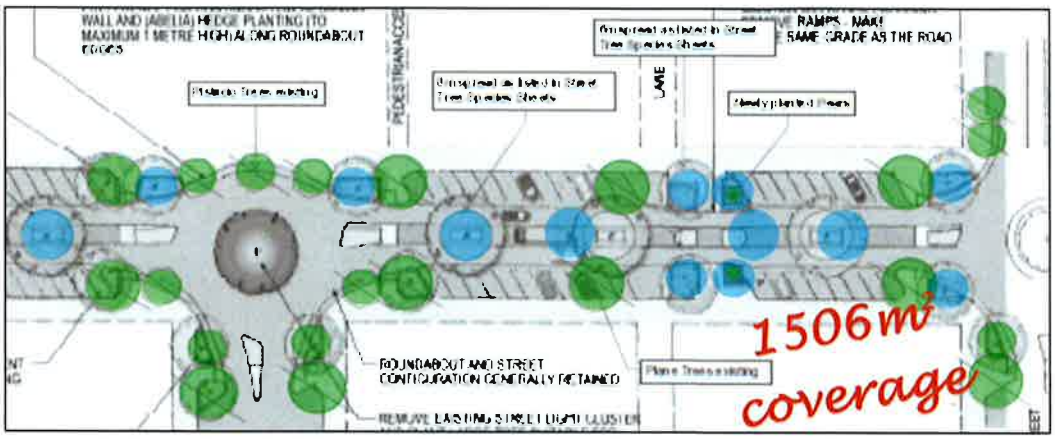

Figure 7 – Option with retained *Platanus,* additional verge planting and increased median planting (canopy cover after 20 years) - Byron Street between Otho and Vivian Streets

Estimates of cover in 20 years assume that no removal of trees occurs due to common causes such as storm damage, vehicle impacts, tree death or decline – in reality, tree population is likely to decrease for those types of reasons. Retaining a range of tree ages within an urban forest population provides a more stable tree coverage over time.

5.6 Techniques for Incorporating Trees into Streetscape Upgrades

The existing Plane Trees can be incorporated into the streetscape design, in addition to or instead of the proposed median plantings. Design of road infrastructure should be in coordination with an AQF Level 5 Arboriculturist to avoid root damage and protect trees in accordance with Australian Standard *AS4970*.

Techniques to retain, protect and manage existing trees within the proposed streetscape works could include: permeable paving with structural root cells which also act as stormwater storage, root barriers to protect infrastructure where far enough from the tree trunk to avoid structural root damage, increased garden beds around trees, moving hardscape further away from trees, drainage routed away from trees, alternative methods of reducing trip hazards, and pruning to minimise maintenance requirements (i.e. avoiding lopping and topping). These techniques need to be designed in coordination with an AQF Level 5 Arboriculturist with experience in design specifications for retention of existing trees during streetscape upgrades. Tree protection during works also needs to be specified at the planning stage to ensure the sustainable retention of the trees.

5.7 Tree Species

Platanus x acerifolia

The species (*Platanus x acerifolia*, London Plane) is performing well in Inverell's streets, considering the difficult growing conditions and the presence of Sycamore Lace Bug. Selection of appropriate tree species for town centre situations can be limited, and there are no 'perfect' tree species, due to the various competing elements and constraints. Tree removal based solely on species is not an appropriate response, with the exception of noxious weeds and nuisance species which have the potential to cause larger problems and costs. There are a limited palette of tree species which can be used successfully in Inverell.

The Plane Tree avenue can continue to be replaced as needed with Plane Trees or cultivars of *Platanus* species in future, or a suite of suitable replacement species could be developed.

The replacement species would need to have similar characteristics including mature size to replace the amenity of the Plane Trees.

Replacement with smaller species, including *Pyrus calleryana* 'Chanticleer' is considered to be insufficient to replace the amenity provided by the *Platanus* trees. *Pyrus* are a small to medium tree, which should only be used as a small subcanopy tree. A larger tree species should be used for the main avenue planting to replace the removed *Platanus* trees.

Where Plane Trees are removed and replaced, the opportunity should be taken to investigate the previous growing conditions, and improve the growing conditions for new plantings, with particular consideration for increasing the useable soil volume (such as with root cells and/or structural soils), and increasing water availability (such as Water Sensitive Urban Design techniques utilising stormwater runoff for watering trees).

Outside of the main street avenue planting, a diverse range of species should be used, to improve biodiversity of the tree population. Some species which may be suitable include Kurrajong, Tulip Tree, Spotted Gum and other cultivars and species of *Platanus*.

5.8 Tree Valuation vs. Cost/Benefit Analysis

A tree valuation is not intended to be a cost/benefit analysis. The value of a tree is independent of the current costs associated with it. It is the tree owner's/manager's responsibility to objectively weigh up the reasonable costs over time with all of the benefits over time, and consider alternative management practices to manage costs while retaining the benefits of tree assets.

The Thyer Method considers environmental, economic and social factors, however Peter Thyer has published a list of additional factors which provide measurable value, which have not yet been included in the calculations. Therefore the assessed nominal values are an underestimation of the trees' values.

Trees have been shown to repay measureable, monetary benefits in excess of the costs invested in them.

Actions which increase the value of trees (which also correlate with best practice tree management) include:

- Providing sufficient space, water, light, oxygen and nutrients to the tree
- Avoiding damage to the tree's roots, trunk, branches and foliage
- Minimising unnecessary pruning
- Design to discourage tree vandalism and accidental damage

Actions which decrease the value of trees (and are not in accordance with best practice) include:

- Pruning large amounts of the tree's crown
- Suppressing the tree's health and access to its requirements, e.g. reducing the tree's growing space, sealing the soil over the tree's root zone
- Not planning for the tree's sustainable retention
- Damage to the tree's trunk, branches and/or roots
- Not investing in maintenance such as formative pruning and watering

6. Conclusions

Removal of the Plane Trees, which are at the beginning of their maturity, is not necessary. Trees deliver most of their value during maturity and the least cost. The highest expense related to planted trees is at the planting and establishment stage and at senescence. Premature removal of trees at the beginning of their maturity foregoes the majority of their value and benefits.

Pruning is being done incorrectly in some cases, and adding unnecessary cost and maintenance. The lopped trees do not need to be continually lopped. The trees which have been lopped are only the historical (1950s) plantings on Otho Street, of which there are thirteen trees. These 'veteran' trees need specific consideration, monitoring and proactively planned maintenance.

Retention of the Plane Trees is possible and warranted from a best practice Urban Forest and asset management perspective. They can be retained with or without the proposed median planting of Pin Oaks, by providing sufficient space within the car parking areas.

An option should be developed during detail design development for the first stage of Byron Street upgrade between Wood and Mansfield Streets, to keep the Plane Trees, Chinese Pistacio and Kurrajong trees as well as installing the median planting and upgrading the streetscape. This would combine the heritage value of the Plane Tree avenue theme, with state of the art tree installation technologies and latest best practice. It would also achieve and exceed the community's goal of maintaining the canopy cover of the town.

The nominal value of the sample of ten trees is approximately $122,000, however the value of two of these trees has been reduced by a total of approximately $10,000 due to poisoning in one case, and topping in the other. Using an average of $12,200 per tree, the sixty three trees would be worth $768,600. However it should be noted that the values reached via the Thyer Method are an underestimation, as discussed in section **0** (page 20).

If any further Plane Trees are removed, such as where excessive damage to a tree's roots has occurred previously (if any), then an AQF Level 5 qualified and experienced Arborist should be engaged to investigate during removal of the tree and while the stump is being excavated, to determine the root structure of the tree planted in a concrete pipe.

7. Recommendations and Specifications

6.1 Street Tree Management Best Practice

- Management of the Inverell CBD street trees should be carried out in accordance with best practice standards. At a minimum, these should include:
  - Prepare tree management policies, particularly within the DCP;
  - Training for Council staff in tree protection during works near trees, and in tree management and planning;
  - Avoid cutting of tree roots by operations staff, with tree root problems to be assessed by a qualified Arboriculturist;

  The 'Guidelines for Developing and Evaluating Tree Ordinances' (Swiecki and Bernhardt, 2001) could be referred to as a starting point for creating Inverell's tree management policies. Other Council's tree management policies are also a valuable source of information regarding accepted policies and procedures.

6.2 Tree Retention

- Retain all of the Plane Trees, as they have all been given a Retention Priority of 'Priority for Retention' or 'Consider for Retention'.
- Retain the other existing street trees within streetscape works, unless individual trees are assessed as unsuitable for retention due to their condition, low significance, Useful Life Expectancy or irreparable structural defects.

6.3 Pruning

- Restorative pruning of the lopped trees, to allow them to develop a normal crown structure to reduce future maintenance needs.
- All pruning to be in accordance with Australian Standard *AS4373-2007 Pruning of amenity trees* – i.e. no lopping or topping of trees.
- Pruning should be limited to the minimum amount required to achieve clearances or the selected pruning where identified by an AQF Level 5 Arborist.

6.4 Further Investigation

- The following trees with defects containing decay are recommended for monitoring and may warrant further investigation, such as sonic tomograph or Resistograph to ascertain their structural stability: **Trees 44** and **48**. These trees are historical plantings, and additional management to sustainably retain the trees is warranted.

6.5 Install Irrigation

- Irrigation should be considered to supply water to the proposed median Pin Oak trees during dry conditions, to prevent dieback and tree loss if WSUD measures are not utilised.

6.6 Pedestrian Management

- Devices such as the existing post and chain fencing should be incorporated into the new streetscape, to discourage pedestrian movement through tree garden beds.

6.7 Design for Trees

- Future works should be designed to minimise adverse impacts on existing trees, and to optimise the opportunities for successful, healthy new tree plantings.
- There are multiple opportunities for additional street tree plantings, and the streetscape should aim to maximise the Urban Forest in the town centre to provide maximum benefits to the community and businesses.

6.8 Monitor Trees

- A walk by visual tree assessment is recommended to be carried out by an AQF Level 5 qualified Arborist, every twelve months, as part of a proactive tree management system.

6.9 Tree Removal

- Tree removal should be considered only where a tree's Useful Life Expectancy (as assessed by an AQF Level 5 qualified Arboriculturist) is less than 5 years, or where the tree presents an unacceptable risk of injury or major property damage which cannot be reduced using other management options. Tree removal should not be seen as the only way of managing adverse interactions between trees and other assets or people.
- All tree removal to be carried out by an AQF Level 3 qualified, experienced and insured Arborist, in accordance with the *Amenity Tree Industry: Code of Practice - 1998*.

6.10 Median Tree Planting

- If the median planting is to be carried out, it should be in addition to retaining the existing trees (wherever possible), as the existing trees are worthy of retention and provide shade to the car parking and pedestrian areas which the proposed tree planting would not replace.
- If possible, the road camber should be towards the median, to direct rainwater into the median plantings, to provide a more sustainable tree planting solution.

6.11 Additional Tree Planting

- Potential additional tree planting locations are available in Inverell town centre. Locations to be checked for underground services. Plant within suitably prepared deep soil areas on site, planted from minimum 45 litre containers.
- Tree planting could be commenced independent of the proposed streetscape upgrade, in surrounding streets to increase the overall canopy cover in the CBD.
- All trees should be sourced from reputable tree nurseries and grown to a minimum standard such as Natspec 'Specifying Trees' (2003) or the Draft Australian Standard *AS2303 - Tree stock for landscape use*.

6.12 Planting Specification

- Tree root cells should be utilised, to manufacturer's specifications, for new tree plantings where underground space allows, such as the median or road edge planting. WSUD should be incorporated in coordination with a Hydraulic Engineer experienced in designing WSUD systems.

- If practicable, cultivate the soil in a large area surrounding the intended planting location (e.g. 1-2m in each direction), to loosen the soil, increase air and water penetration into lower layers of soil, and also allow for future root growth.
- At a minimum the planting hole should be three times the diameter of the plant container, and the same depth as the container depth, to prevent settling of soil causing the tree to sink after planting. The finished level of the top of the root ball should be flush with the surrounding soil.
- Apply mulch 75-100mm deep at least 500mm radius from the trunk, and dished away from the trunk.
- Where the tree planting is near any public thoroughfare, timber tree guard structures should be installed for the first few years of the trees' life, to minimise tree damage. Footings for the structure should be well outside the root ball of the planted tree.
- Establishment maintenance including watering and formative pruning is required for newly planted trees.

The recommendations of this report do not constitute consent to carry out works.

Further information and clarification can be obtained from the author.

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8. References

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Green Infrastructure Evidence Base – Botanic Gardens of South Australia

City of Sydney, (2013) Sydney Streets Design Code

9. Definitions & Concepts

Green infrastructure –the network of green spaces and water systems that deliver multiple environmental, economic and social values and benefits (Botanic Gardens of South Australia)

Heat Island Effect – increased ambient air temperatures around buildings and hard surfaces in urban environments. This is primarily due to increased reflected or reradiated sunlight, reduced evapotranspiration and shade from trees and other vegetation, air pollution, less open bodies of water reducing evaporation and humidity, with the effect worsened when wind speed is slow. (Draper & Richards, 2009)

Lopping – cutting between branch unions (not to branch collars), or at internodes on a young tree, with the final cut leaving a stub or palm over-pruning. (Draper & Richards, 2009)

Organic mulch – partially composted 'green waste' such as woodchip, bark, leaf litter and organic matter, used as a soil conditioner and to reduce evaporation and compaction of soil

Pollarding – a specialised pruning technique that establishes branches ending in a pollard head of buds and vigorous shoots. Trees are cut back to just above the same point every 1 to 3 years resulting in the production of multiple shoots. When removing shoots, pollard heads should not be injured. Cuts should be made as close as possible to the swollen collars that surround each shoot. (AS4373-2007)

Pruning – the removal of branches or tree parts in accordance with Australian Standard *AS4373-2007 Pruning of amenity trees* by a qualified and experienced AQF Level 3 Arborist.

Structural Root Zone (SRZ) – an area calculated in accordance with *AS4970-2009*, which is the nominal minimum radius of root zone which needs to be undisturbed for the tree's stability. Additional root zone area is needed to sustain the tree (i.e. the Tree Protection Zone). As a guide, a tree with a trunk diameter above the root buttress of 300mm, has an SRZ radius of 2m, 400mm – 2.25m, 500mm – 2.5m, 600mm – 2.7m, and a trunk diameter of 1m gives an SRZ of 3.3m.

Topping – removal of the upper part of the tree, reducing its height by lopping. This practice usually damages trees, reducing strength, condition and vigour promoting premature decline and exposure to pests and diseases. (Draper & Richards, 2009)

Tree Protection Zone (TPZ) – a nominal area calculated in accordance with *AS4970-2009*, which is the nominal minimum radius of root zone which needs to be undisturbed for the tree's survival and ongoing health. The radius is equal to 12 times the diameter of the trunk at breast height (1.3m).

Tree sensitive urban design – consideration of the role, value and requirements of trees as assets in built up areas, from the planning and design stage, through to demolition, construction and completion of development or upgrades.

Tree Valuation – a process to determine the monetary or intrinsic worth of a tree. (Draper & Richards, 2009)

"Trees as assets" – trees have measurable economic contributions in an inhabited area, many of which have been studied and quantified, such as stormwater management, pollutant removal, reduction in heating and cooling costs, and increase in property values.

Urban Forest - a holistic view of all vegetation, public and private, native and exotic, trees and understorey, which provide the many benefits of having vegetation in developed areas. The Urban Forest approach goes beyond the maintenance and replacement methodology and aims to manage the whole life cycle of tree populations.

Water Sensitive Urban Design – an approach to the planning and design of urban environments that supports healthy ecosystems, lifestyles and livelihoods through smart management of all our waters. (waterbydesign.com.au)

14/03/16 Tree Survey Information - Arboricultural Assessment - BYRON OTHO STREETS INVERELL
Inspection: 06/02/16
MUST BE READ IN CONJUNCTION WITH ARBORICULTURAL ASSESSMENT REPORT

Tree No.	Tree Type	Botanical & Common Name	Height	Spread	DBH (mm)	DRB (mm)	Age	Health	Condition	ULE	Significance	SRZ	TPZ	Retention Rating	Value (Thyer)	Site Notes
1	B	*Platanus x acerifolia* London Plane Tree	11	10	400	450	M	Av	Av	S	M-H	2.4	4.8	CR	$7,617 $10,200	Dieback, drooping yellowish foliage. Spiral wounds x 3 with drill hole at base of each. Many branch pruning stubs @3m. Sycamore Lace Bug. Lowest foliage @3m. In bitumen. Exposed roots. Poisoned tree. Normal form.
2	B	*Platanus sp.* Plane Tree	12	10	400	450	M	Av	G	L	M-H	2.4	4.8	PR	$8,835	Vein chlorosis - yellow speckled. Sycamore Lace Bug. Some epicormics on trunk. Root mass around base. In bitumen. Normal form (i.e. not lopped). Power service line to N.
3	B	*Platanus x acerifolia* London Plane Tree	10											PR		Similar to T2.
4	B	*Platanus x acerifolia* London Plane Tree	10											PR		Similar to T2.
5	B	*Platanus x acerifolia* London Plane Tree	7	5	200	250	SM	G	G	L	M	1.8	2.4	PR		Smaller tree. Similar to T2.
6	B	*Platanus x acerifolia* London Plane Tree	10	8	300	350	M	Av	G	L	M	2.1	3.6	PR	$6,105	Small amount of Sycamore Lace Bug. Scale & rust on foliage. In bitumen in concrete ring 1m diam. around trunk. Some surface roots over the top. Bitumen close to trunk. Lowest branches @3m. Normal form. Bitumen repairs around.
7	B	*Platanus x acerifolia* London Plane Tree												PR		Similar to T2.
8	VG	*Platanus x acerifolia* London Plane Tree	11	8	300	350	M	Av	Av	M-L	M-H	2.1	3.6	PR	$6,674	Sparse. In garden bed next to crossing. Small leaf size. Newish paving - roots may have been damaged. Normal form.
9	B	*Platanus x acerifolia* London Plane Tree												PR		Similar to T2.
10	B	*Platanus x acerifolia* London Plane Tree	9	8	250	300	M	Av	Av	M-L	M-H	2.0	3.0	CR		In bitumen, in pipe - roots over top. Damage to root buttress. Wounds on trunk - vehicle impacts. Lowest branch @2.5m. Bitumen over roots. Normal form.
11	VP	*Platanus sp.* Plane Tree	12	12	400	450	M	G	G	L	H	2.4	4.8	PR		Paved corner near roundabout. 1.3m square opening. Irrigation pipe against trunk. Exposed root. Pavers slightly lifting in close proximity. Crack in kerb. Normal form. Low foliage - minor crown lift needed (to Aust. Std AS4373).
12	VP	*Platanus x acerifolia* London Plane Tree	11	10	400	450	M	Av	G	L	M-H	2.4	4.8	PR		In 1.2x1.2m opening in pavers near crossing. Minor lifting & cracking. Exposed roots. Irrigation pipe. Foliage dense on branches. Normal form.
13	B	*Platanus x acerifolia* London Plane Tree	6	6	200	250	SM	G	Av	M	M	1.8	2.4	CR		Vehicle impact wounds. Low branches pruned. In bitumen - bitumen over exposed roots. Crown lift needed. Sycamore Lace Bug. Slight lean to buildings. Drainage low point. Normal form.
14	VP	*Platanus sp.* Plane Tree	13	10	500	600	M	Av	G	M-L	H	2.7	6.0	PR	$12,733	At crossing. Paver circle & metal ring around - remove pavers & metal. Take out corner of paving. Sycamore Lace Bug & rust. Exposed roots. Some epicormics. Normal form.

Highlighted trees = assessed trees

Tree No.	Tree Type	Botanical & Common Name	Height	Spread	DBH (mm)	DRB (mm)	Age	Health	Condition	ULE	Significance	SRZ	TPZ	Retention Rating	Value (Thyer)	Site Notes
15	VP	*Platanus x acerifolia* London Plane Tree	11	10	300	350	M	Av	G	M-L	H	2.1	3.6	PR		Similar to T14.
16	VP	*Platanus x acerifolia* London Plane Tree	12	10	400	450	M	Av	G	M-L	H	2.4	4.8	PR		Similar to T14.
17	B	*Platanus x acerifolia* London Plane Tree												PR		
18	B	*Platanus x acerifolia* London Plane Tree												PR		
19	VP	*Platanus x acerifolia* London Plane Tree	10	8	350	400	M	G	G	M-L	H	2.3	4.2	PR		Large root buttress filling space in pavers. Sycamore Lace Bug. Minor paver lift - reduce paving. Normal form. **Removed 13 March 2016** - option existed to enlarge space in pavers, replace kerb as done for new trees.
20	VP	*Platanus x acerifolia* London Plane Tree	10	10	400	450	M	G	G	M-L	M-H	2.4	4.8	PR		Root mass filling space in pavers - reduce paving. Irrigation pipe - tree roots grown over. Crack in gutter.
21	VP	*Platanus x acerifolia* London Plane Tree	12	6	250	300	SM	G	G	M-L	M-H	2.0	3.0	PR		Root mass in space in paving.
22	VP	*Platanus x acerifolia* London Plane Tree												PR		
23	VP	*Platanus x acerifolia* London Plane Tree												PR		**Removed 13 March 2016** - option existed to enlarge space in pavers, replace kerb as done for new trees.
24	B	*Platanus x acerifolia* London Plane Tree												PR		
25	B	*Platanus x acerifolia* London Plane Tree												PR		
26	VP	*Platanus x acerifolia* London Plane Tree												PR		
27	VP	*Platanus x acerifolia* London Plane Tree												PR		
28	VP	*Platanus x acerifolia* London Plane Tree												PR		**Removed 13 March 2016** - option existed to enlarge space in pavers, replace kerb as done for new trees.
29	VP	*Platanus x acerifolia* London Plane Tree												PR		
29A	VP	*Platanus x acerifolia* London Plane Tree												PR		
29B	VP	*Platanus x acerifolia* London Plane Tree												PR		

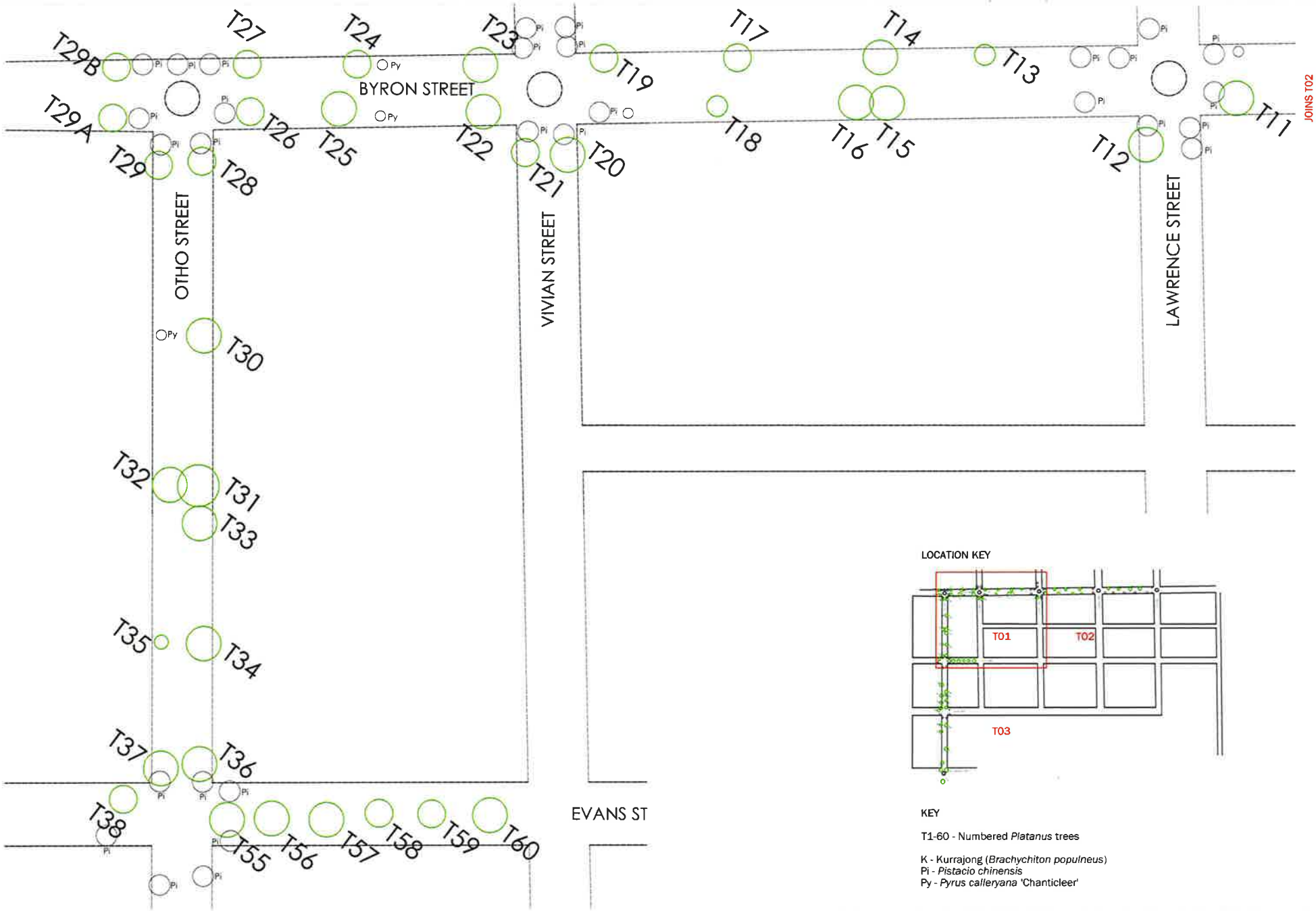
Tree No.	Tree Type	Botanical & Common Name	Height	Spread	DBH (mm)	DRB (mm)	Age	Health	Condition	ULE	Significance	SRZ	TPZ	Retention Rating	Value (Thyer)	Site Notes
30	B	*Platanus x acerifolia* London Plane Tree												PR		
31	VP	*Platanus sp.* Plane Tree	11	12	300	350	M	G	G	M-L	H	2.1	3.6	PR	$14,254	At crossing. Metal ring & pavers around.
32	VP	*Platanus x acerifolia* London Plane Tree	11	10	400	450	M	Av	G	M-L	H	2.4	4.8	PR		At crossing. Metal ring & pavers around. Yellowish foliage - Sycamore Lace Bug.
33	VP	*Platanus sp.* Plane Tree	10	10	300	350	M	G	G	M-L	H	2.1	3.6	PR		At crossing. Metal ring & pavers around.
34	B	*Platanus x acerifolia* London Plane Tree												PR		
35	B	*Platanus x acerifolia* London Plane Tree												PR		
36	VP	*Platanus x acerifolia* London Plane Tree												PR		
37	VP	*Platanus x acerifolia* London Plane Tree												PR		
38	VP	*Platanus x acerifolia* London Plane Tree	10	8	300	350	M	Av	Av	S-M	M	2.1	3.6	CR		Very sparse, small foliage. Tip browning. Metal edge square space in pavers 1.2x1.2m. Slight lifting.
38A	BR	*Platanus x acerifolia* London Plane Tree												PR		In raised bed in bitumen.
39	VR	*Platanus x acerifolia* London Plane Tree	11	12	850	950	M	Av	Av	M-L	H	3.2	10.2	PR		Historic planting. Lopped, poor pruning. In raised bed next to crossing. Sycamore Lace Bug.
40	BR	*Platanus x acerifolia* London Plane Tree												PR		Historic planting.
41	BR	*Platanus x acerifolia* London Plane Tree		12	800	900						3.2	9.6	PR		Historic planting. Exposed roots. Lopped, epicormics. Raised bed - loose blocks displaced.
42	BR	*Platanus x acerifolia* London Plane Tree												PR		Historic planting.
43	BR	*Platanus x acerifolia* London Plane Tree						G	Av					PR		Historic planting.

Highlighted trees = assessed trees

Tree No.	Tree Type	Botanical & Common Name	Height	Spread	DBH (mm)	DRB (mm)	Age	Health	Condition	ULE	Significance	SRZ	TPZ	Retention Rating	Value (Thyer)	Site Notes
44	BR	*Platanus x acerifolia* London Plane Tree	9	8	600	700	M	G	Av	M	M-H	2.8	7.2	CR		Historic planting. Low branches pruned. Cavity in root buttress - hollow. 5x2m raised bed. Epicormics.
45	VR	*Platanus x acerifolia* London Plane Tree												PR		Historic planting.
46	VR	*Platanus x acerifolia* London Plane Tree												PR		Historic planting.
47	VR	*Platanus x acerifolia* London Plane Tree	7	8	600	700	M	G	Av	M	M	2.8	7.2	PR	$12,047	Historic planting. Lopped under powerlines. Exposed roots. Slight raised bed in pavers - lifting. Dense low foliage. Near crossing. Crown lift pruning needed (to Aust. Std AS4373).
48	B	*Platanus x acerifolia* London Plane Tree	10	8	700	800	M	Av	Av	M	M	3.0	8.4	CR		Historic planting. Lopped @1.5m - wound with some decay. In bitumen, not raised bed. Epicormics made up crown. Tops of roots damaged.
49	B	*Platanus x acerifolia* London Plane Tree												PR		Historic planting.
50	B	*Platanus x acerifolia* London Plane Tree												PR		Historic planting.
51	B	*Platanus x acerifolia* London Plane Tree	12	12	1100	1200	M	G	G	L	H	3.6	13.2	PR	$29,268	In bitumen. Near driveway. Suckers from base. Old lopped.
52	VO	*Platanus x acerifolia* London Plane Tree	7	10	550	600	M	G	Av	M-L	M-H	2.7	6.6	CR	$6,354 $13,869	In grass near roundabout - "gateway" into town. Recently lopped, i.e. poorly pruned, not in accordance with AS4373.
53	VO	*Platanus x acerifolia* London Plane Tree	7	10	650	750	M	G	Av	M-L	H	2.9	7.8	CR		In grass near roundabout - "gateway" into town. Recently lopped, i.e. poorly pruned, not in accordance with AS4373. Similar to T52.
54	VO	*Platanus x acerifolia* London Plane Tree	6	10	650	750	M	G	Av	M-L	H	2.9	7.8	CR		In grass near roundabout - "gateway" into town. Recently lopped, i.e. poorly pruned, not in accordance with AS4373. Large root previously cut for footpath 1m from centre. Similar to T52.
55-60	VO	*Platanus x acerifolia* London Plane Tree			700 est									PR	$18,583 estimate	Evans St median strip. Median should be enlarged in future to retain the trees without damaging roots.

Key: Height (in metres) ; Spread (crown spead in metres) ; DBH (Diameter at Breast Height / 1.4m) in millimetres ; DRB (Diameter above Root Buttress) in millimetres ; Age (Semi-mature, Mature, Overmature, or Senescent) ; Health (Good, Average or Poor) ; Condition (Good, Average or Poor) ; Useful Life Expectancy (ULE) (Short, Medium or Long) ; Significance (High, Medium or Low) ; Structural Root Zone (SRZ) radius in metres ; Tree Protection Zone (TPZ) radius in metres ; Retention Rating (PR: Priority for Retention, CR: Consider for Retention, C-: Consider for Removal, P-: Priority for Removal) ; Value of Tree using Thyer Method (where 2 figures are given, top amount is current value, bottom amount is estimated value prior to damage).

Highlighted trees = assessed trees



LOCATION KEY

KEY

T1-60 - Numbered *Platanus* trees

K - Kurrajong (*Brachychiton populneus*)
Pi - *Pistacio chinensis*
Py - *Pyrus calleryana* 'Chanticleer'

MUST BE READ IN CONJUNCTION WITH ARBORICULTURAL ASSESSMENT REPORT

A	PRELIMINARY ADVICE	JB	19-02-16
B	FOR REPORT	JB	14-03-16

new leaf arboriculture

SYDNEY Email: newleafarb@gmail.com
Web: www.newleaftrees.com.au
JACK! BROWN
Accredited Member of the Institute of Australian Consulting Arboriculturists
Member of the International Society of Arboriculture

INVERELL TOWN CENTRE

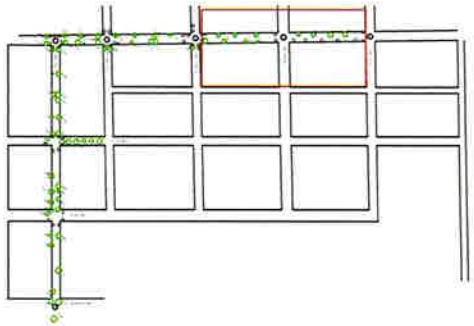
EXISTING PLANE TREE ASSESSMENT

CONCERNED INVERELL RATEPAYERS ASSOC.

TREE LOCATION PLAN

1:1000 @ A3	REP	T - 01 of 3	
JB		14-03-16	B

LOCATION KEY



KEY

T1-60 - Numbered *Platanus* trees

K - Kurrajong (*Brachychiton populneus*)
Pi - *Pistacio chinensis*
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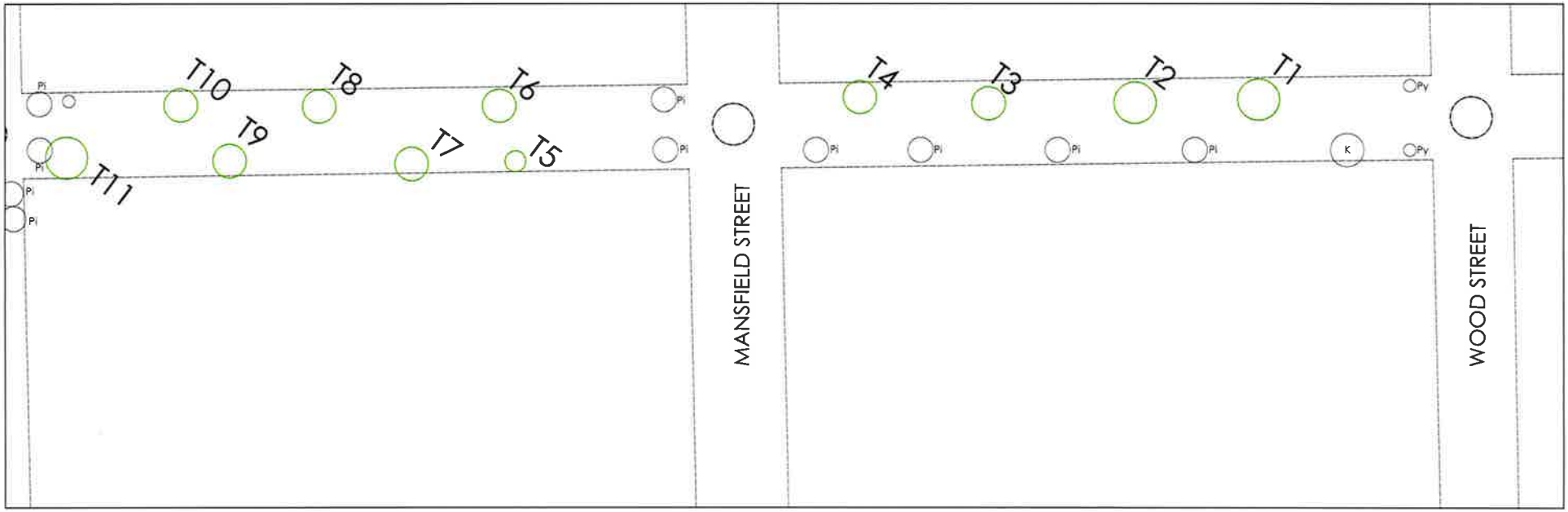

MUST BE READ IN CONJUNCTION WITH ARBORICULTURAL ASSESSMENT REPORT

A	PRELIMINARY ADVICE	JB	19-02-16
B	FOR REPORT	JB	14-03-16

new leaf arboriculture

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INVERELL TOWN CENTRE

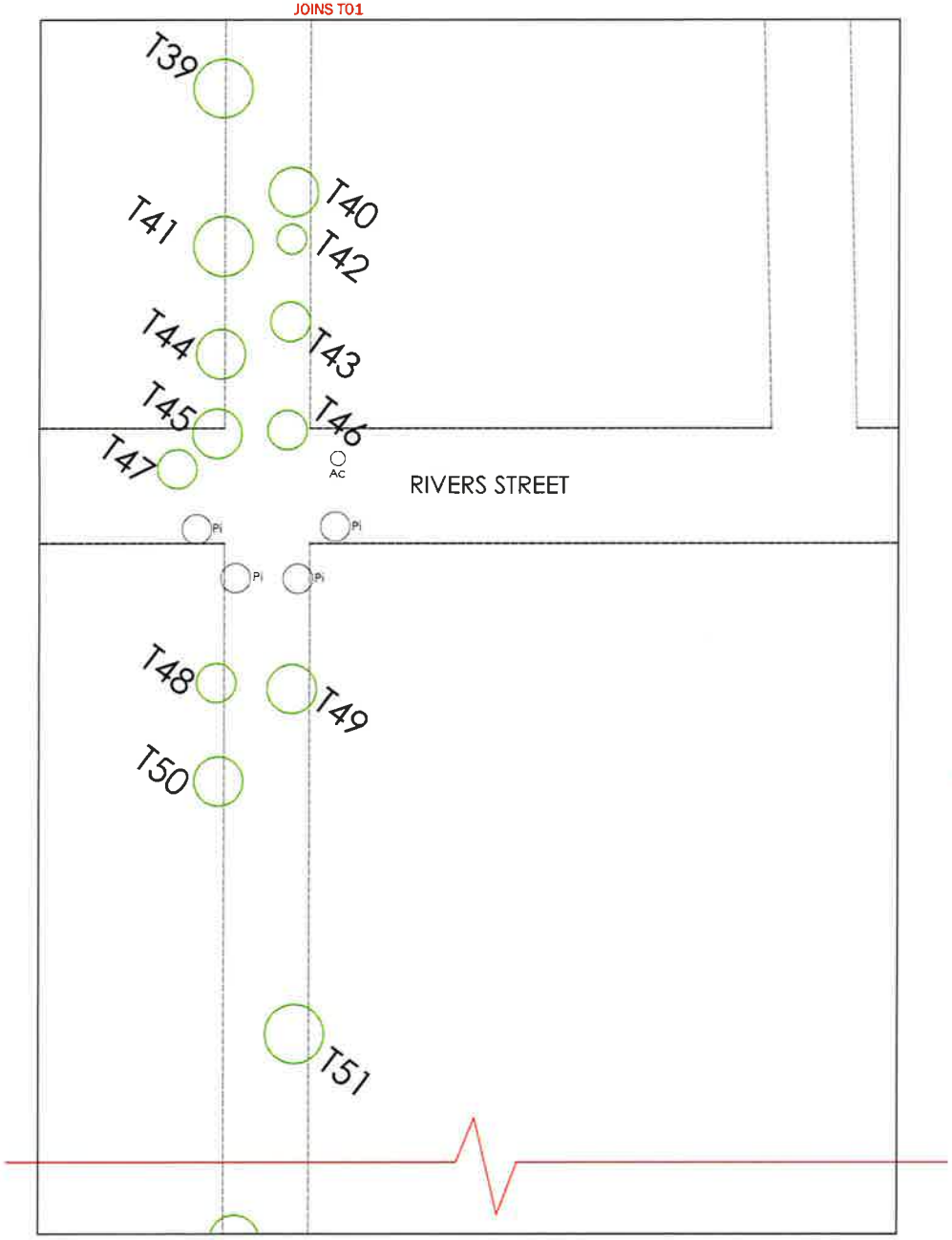
EXISTING PLANE TREE ASSESSMENT

CONCERNED INVERELL RATEPAYERS ASSOC.

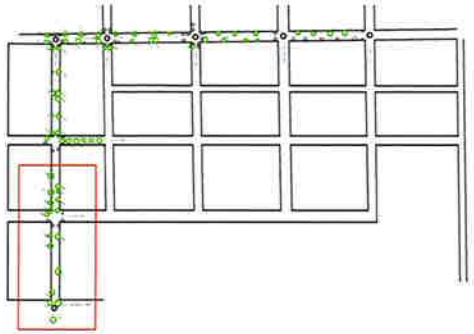
TREE LOCATION PLAN

1:2500 @ A3	REP	T - 02 of 3	
JB		14-03-16	B

JOINS T01



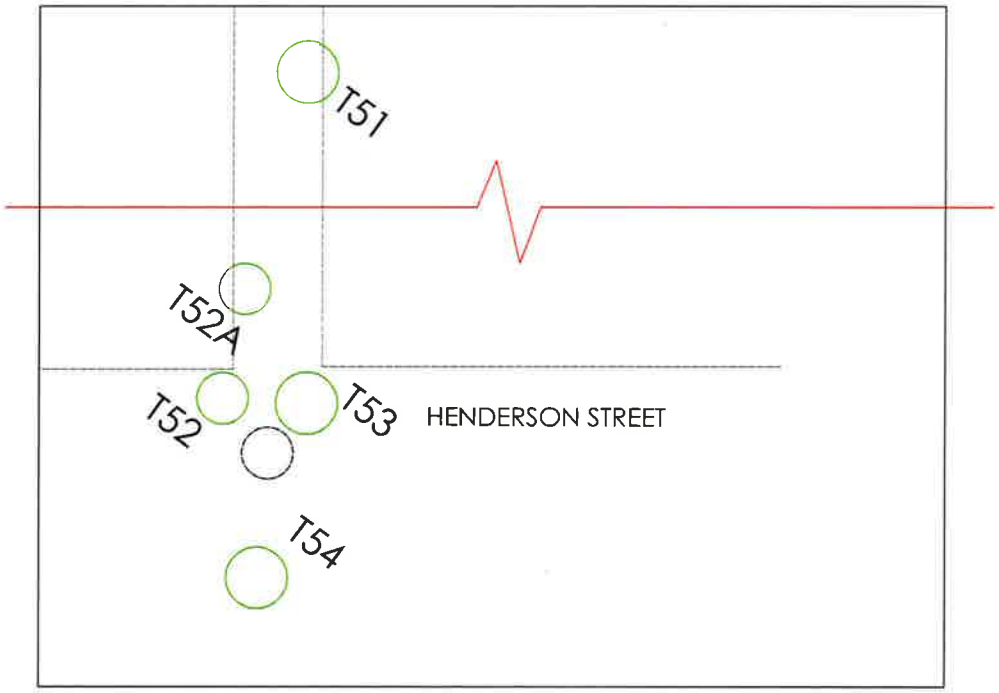
LOCATION KEY



KEY

T1-60 - Numbered *Platanus* trees

K - Kurrajong (*Brachychiton populneus*)
Pi - *Pistacio chinensis*
Py - *Pyrus calleryana* 'Chanticleer'



MUST BE READ IN CONJUNCTION WITH ARBORICULTURAL ASSESSMENT REPORT

A	PRELIMINARY ADVICE	JB	19-02-16
B	FOR REPORT	JB	14-03-16

new leaf arboriculture

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INVERELL TOWN CENTRE

EXISTING PLANE TREE ASSESSMENT

CONCERNED INVERELL RATEPAYERS ASSOC.

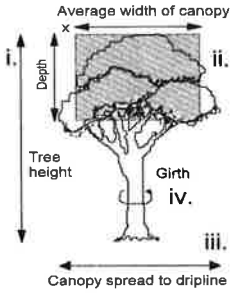
TREE LOCATION PLAN

1:2500 @ A3	REP	T - 03 of 3	
JB		14-03-16	B

THYER TREE VALUATION WORKSHEET 2000b

File	NL_Inverell_140316		
DATE	Feb-16		
LOCATION	Otho Street Inverell	VALUER	Jacki Brown
SPECIES	Platanus x hybrida	Tree No	**1 (before)**

SIZE FACTOR (S) All measurements in metres



I. Height of tree	11.00		
ii. Area of canopy (side view)	80.00	Calculations : ii Can. side area : Depth	8.00
Depth x Spread = 80		x aver. width	10.00
iii. Average diameter to dripline	10.00		
iv. Circumference of trunk (girth) at bh	1.26	Dbh	0.40
Dbh x pi = girth : 1.2572			

Size Factor : i. + ii. + iii. + iv. = 102.26 ÷ (10 + ii /100) S **9.47**

AGE FACTOR (A)

Age Factor : 0.02 x **20** (age of tree in years) + 0.5 A **0.90**

QUALITIES : PHYSICAL AND SOCIAL (Q)

Qi. Physical. If any score is zero, total the previous scores only and proceed to Qii.

	0	1	2	4	8	Score
Health	Dead or rapidly dying.	Surviving only. Treatment may help recovery	Damaged, diseased or restricted growth. Treatment will help	Normal growth and no recent damage	Thriving and no damage	3
Environmental benefit	Weed species	Restricts desirable plants or of little benefit to fauna	Beneficial to flora or fauna, provides food source, shelter	Remnant species of native vegetation	Indigenous species being integral part of native ecosystem	2
Life expectancy beyond present	0 - 5 years	5 - 20 years	20 - 50 years	50 - 100 years	> 100 years	4
Re-establishment potential of same species on site	Water required at planting time only	Three months maintenance required	Soil improvement and two year maint. required	Soil improvement, plant protection & ongoing maint. req.	Extremely difficult due to pollution, vandalism etc.	4
Rate of growth over first 10 years	> 2000 mm/year	800-2000 mm/yr	400- 800 mm/yr	200-400 mm/yr	< 200 mm/year	2

Addition total of Qi. scores 15.0

Qii. Social. If any score is zero, total the previous scores only.

	0	2	4	8	16	Score
Social benefit	Dangerous, or totally unsuitable for the site	Hazardous, or outgrown most beneficial size	No special function or some problem characteristics	Special function; screen, flower, fruit, Landscape feature	Tree creates 'Sense of Place'	12
Form and features	Ugly and not interesting	Ordinary or plain	Attractive or interesting for part of the year	Attractive or interesting in all seasons	Superb , appealing specimen	8
Social Significance	Seldom seen	Seen frequently by private owners or adjacent residents	Seen by neighbour-hood residents or passers by	Known locally or seen by many passers by	Of local historical importance, or known widely	10

Addition total of Qii. scores 30.0

Physical and Social Qualities Factor = Qi. + Qii. Q **45.0**

SIGNIFICANCE INDEX (S x A x Q) 383

PLANTING COST (P)

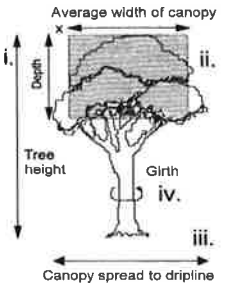
Average Landscape industry $ rate to supply & plant a 5 litre tree on local projects in December 2015 $ P 26.60

TREE VALUE = S x A x Q x P **$ 10,200**

THYER TREE VALUATION WORKSHEET 2000b

File	NL_Inverell_140316		
DATE	Feb-16		
LOCATION	Otho Street Inverell	VALUER	Jacki Brown
SPECIES	Platanus x hybrida	Tree No	**1 (after poison)**

SIZE FACTOR (S) All measurements in metres



I. Height of tree	11.00		
		Calculations :	
ii. Area of canopy (side view)	60.00	ii Can. side area : Depth	6.00
Depth x Spread = 60		x aver. width	10.00
iii. Average diameter to dripline	10.00		
iv. Circumference of trunk (girth) at bh	1.26	Dbh	0.40
Dbh x pi = girth : 1.2572			

Size Factor : i. + ii. + iii. + iv. = 82.26 ÷ (10 + ii /100) S **7.76**

AGE FACTOR (A)

Age Factor : 0.02 x **20** (age of tree in years) + 0.5 A **0.90**

QUALITIES : PHYSICAL AND SOCIAL (Q)

Qi. Physical. If any score is zero, total the previous scores only and proceed to Qii.

	0	1	2	4	8	Score
Health	Dead or rapidly dying.	Surviving only. Treatment may help recovery	Damaged, diseased or restricted growth. Treatment will help	Normal growth and no recent damage	Thriving and no damage	2
Environmental benefit	Weed species	Restricts desirable plants or of little benefit to fauna	Beneficial to flora or fauna, provides food source, shelter	Remnant species of native vegetation	Indigenous species being integral part of native ecosystem	2
Life expectancy beyond present	0 - 5 years	5 - 20 years	20 - 50 years	50 - 100 years	> 100 years	1
Re-establishment potential of same species on site	Water required at planting time only	Three months maintenance required	Soil improvement and two year maint. required	Soil improvement, plant protection & ongoing maint. req.	Extremely difficult due to pollution, vandalism etc.	4
Rate of growth over first 10 years	> 2000 mm/year	800-2000 mm/yr	400- 800 mm/yr	200-400 mm/yr	< 200 mm/year	2

Addition total of Qi. scores 11.0

Qii. Social. If any score is zero, total the previous scores only.

	0	2	4	8	16	Score
Social benefit	Dangerous, or totally unsuitable for the site	Hazardous, or outgrown most beneficial size	No special function or some problem characteristics	Special function; screen, flower, fruit, Landscape feature	Tree creates 'Sense of Place'	12
Form and features	Ugly and not interesting	Ordinary or plain	Attractive or interesting for part of the year	Attractive or interesting in all seasons	Superb , appealing specimen	8
Social Significance	Seldom seen	Seen frequently by private owners or adjacent residents	Seen by neighbour-hood residents or passers by	Known locally or seen by many passers by	Of local historical importance, or known widely	10

Addition total of Qii. scores 30.0

Physical and Social Qualities Factor = Qi. + Qii. Q **41.0**

SIGNIFICANCE INDEX (S x A x Q) 286

PLANTING COST (P)

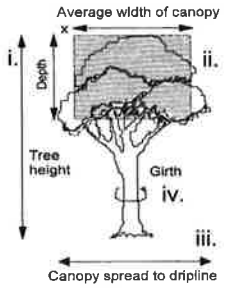
Average Landscape industry $ rate to supply & plant a 5 litre tree on local projects in December 2015 $ P 26.60

TREE VALUE = S x A x Q x P **$ 7,617**

THYER TREE VALUATION WORKSHEET 2000b

File	NL_Inverell_140316		
DATE	Feb-16		
LOCATION	Otho Street Inverell	VALUER	Jacki Brown
SPECIES	Platanus x hybrida	Tree No	2

SIZE FACTOR (S) All measurements in metres



I. Height of tree	12.00		
ii. Area of canopy (side view)	64.00	Calculations : ii Can. side area : Depth	8.00
Depth x Spread = 64		x aver. width	8.00
iii. Average diameter to dripline	10.00		
iv. Circumference of trunk (girth) at bh	1.26	Dbh	0.40
Dbh x pi = girth : 1.2572			

Size Factor : i. + ii. + iii. + iv. = 87.26 ÷ (10 + ii /100) S **8.20**

AGE FACTOR (A)

Age Factor : 0.02 x **20** (age of tree in years) + 0.5 A **0.90**

QUALITIES : PHYSICAL AND SOCIAL (Q)

Qi. Physical. If any score is zero, total the previous scores only and proceed to Qii.

	0	1	2	4	8	Score
Health	Dead or rapidly dying.	Surviving only. Treatment may help recovery	Damaged, diseased or restricted growth. Treatment will help	Normal growth and no recent damage	Thriving and no damage	3
Environmental benefit	Weed species	Restricts desirable plants or of little benefit to fauna	Beneficial to flora or fauna, provides food source, shelter	Remnant species of native vegetation	Indigenous species being integral part of native ecosystem	2
Life expectancy beyond present	0 - 5 years	5 - 20 years	20 - 50 years	50 - 100 years	> 100 years	4
Re-establishment potential of same species on site	Water required at planting time only	Three months maintenance required	Soil improvement and two year maint. required	Soil improvement, plant protection & ongoing maint. req.	Extremely difficult due to pollution, vandalism etc.	4
Rate of growth over first 10 years	> 2000 mm/year	800-2000 mm/yr	400- 800 mm/yr	200-400 mm/yr	< 200 mm/year	2

Addition total of Qi. scores 15.0

Qii. Social. If any score is zero, total the previous scores only.

	0	2	4	8	16	Score
Social benefit	Dangerous, or totally unsuitable for the site	Hazardous, or outgrown most beneficial size	No special function or some problem characteristics	Special function; screen, flower, fruit, Landscape feature	Tree creates 'Sense of Place'	12
Form and features	Ugly and not interesting	Ordinary or plain	Attractive or interesting for part of the year	Attractive or interesting in all seasons	Superb , appealing specimen	8
Social Significance	Seldom seen	Seen frequently by private owners or adjacent residents	Seen by neighbour-hood residents or passers by	Known locally or seen by many passers by	Of local historical importance, or known widely	10

Addition total of Qii. scores 30.0

Physical and Social Qualities Factor = Qi. + Qii. Q **45.0**

SIGNIFICANCE INDEX (S x A x Q) 332

PLANTING COST (P)

Average Landscape industry $ rate to supply & plant a 5 litre tree on local projects in December 2015 $ P 26.60

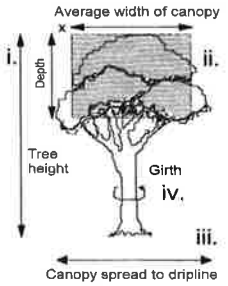
TREE VALUE = S x A x Q x P **$ 8,835**

 with 2004 NSW LCA planting cost = $19.80

THYER TREE VALUATION WORKSHEET 2000b

File	NL_Inverell_140316		
DATE	Feb-16		
LOCATION	Otho Street Inverell	VALUER	Jacki Brown
SPECIES	Platanus x hybrida	Tree No	6

SIZE FACTOR (S) All measurements in metres



I. Height of tree	10.00			
		Calculations :		
ii. Area of canopy (side view)	40.00	ii Can. side area : Depth	5.00	
Depth x Spread = 40		x aver. width	8.00	
iii. Average diameter to dripline	8.00			
iv. Circumference of trunk (girth) at bh	0.94	Dbh	0.30	
Dbh x pi = girth : 0.9429				

Size Factor : i. + ii. + iii. + iv. = 58.94 ÷ (10 + ii /100) S **5.67**

AGE FACTOR (A)

Age Factor : 0.02 x **20** (age of tree in years) + 0.5 A **0.90**

QUALITIES : PHYSICAL AND SOCIAL (Q)

Qi. Physical. If any score is zero, total the previous scores only and proceed to Qii.

	0	1	2	4	8	Score
Health	Dead or rapidly dying.	Surviving only. Treatment may help recovery	Damaged, diseased or restricted growth. Treatment will help	Normal growth and no recent damage	Thriving and no damage	3
Environmental benefit	Weed species	Restricts desirable plants or of little benefit to fauna	Beneficial to flora or fauna, provides food source, shelter	Remnant species of native vegetation	Indigenous species being integral part of native ecosystem	2
Life expectancy beyond present	0 - 5 years	5 - 20 years	20 - 50 years	50 - 100 years	> 100 years	4
Re-establishment potential of same species on site	Water required at planting time only	Three months maintenance required	Soil improvement and two year maint. required	Soil improvement, plant protection & ongoing maint. req.	Extremely difficult due to pollution, vandalism etc.	4
Rate of growth over first 10 years	> 2000 mm/year	800-2000 mm/yr	400- 800 mm/yr	200-400 mm/yr	< 200 mm/year	2

Addition total of Qi. scores 15.0

Qii. Social. If any score is zero, total the previous scores only.

	0	2	4	8	16	Score
Social benefit	Dangerous, or totally unsuitable for the site	Hazardous, or outgrown most beneficial size	No special function or some problem characteristics	Special function; screen, flower, fruit, Landscape feature	Tree creates 'Sense of Place'	12
Form and features	Ugly and not interesting	Ordinary or plain	Attractive or interesting for part of the year	Attractive or interesting in all seasons	Superb , appealing specimen	8
Social Significance	Seldom seen	Seen frequently by private owners or adjacent residents	Seen by neighbour-hood residents or passers by	Known locally or seen by many passers by	Of local historical importance, or known widely	10

Addition total of Qii. scores 30.0

Physical and Social Qualities Factor = Qi. + Qii. Q **45.0**

SIGNIFICANCE INDEX (S x A x Q) 230

PLANTING COST (P)

Average Landscape industry $ rate to supply & plant a 5 litre tree on local projects in December 2015 $ P 26.60

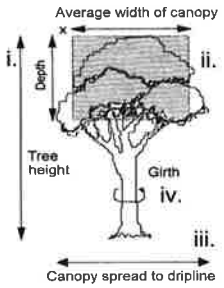
TREE VALUE = S x A x Q x P **$ 6,105**

 with 2004 NSW LCA planting cost = $19.80

THYER TREE VALUATION WORKSHEET 2000b

File	NL_Inverell_140316		
DATE	Feb-16		
LOCATION	Otho Street Inverell	VALUER	Jacki Brown
SPECIES	Platanus x hybrida	Tree No	8

SIZE FACTOR (S) All measurements in metres



I. Height of tree	11.00		
ii. Area of canopy (side view)	48.00	Calculations : ii Can. side area : Depth	6.00
Depth x Spread = 48		x aver. width	8.00
iii. Average diameter to dripline	8.00		
iv. Circumference of trunk (girth) at bh	0.94	Dbh	0.30
Dbh x pi = girth : 0.9429			

Size Factor : i. + ii. + iii. + iv. = 67.94 ÷ (10 + ii /100) S **6.48**

AGE FACTOR (A)

Age Factor : 0.02 x **20** (age of tree in years) + 0.5 A **0.90**

QUALITIES : PHYSICAL AND SOCIAL (Q)

Qi. Physical. If any score is zero, total the previous scores only and proceed to Qii.

	0	1	2	4	8	Score
Health	Dead or rapidly dying.	Surviving only. Treatment may help recovery	Damaged, diseased or restricted growth. Treatment will help	Normal growth and no recent damage	Thriving and no damage	2
Environmental benefit	Weed species	Restricts desirable plants or of little benefit to fauna	Beneficial to flora or fauna, provides food source, shelter	Remnant species of native vegetation	Indigenous species being integral part of native ecosystem	2
Life expectancy beyond present	0 - 5 years	5 - 20 years	20 - 50 years	50 - 100 years	> 100 years	3
Re-establishment potential of same species on site	Water required at planting time only	Three months maintenance required	Soil improvement and two year maint. required	Soil improvement, plant protection & ongoing maint. req.	Extremely difficult due to pollution, vandalism etc.	4
Rate of growth over first 10 years	> 2000 mm/year	800-2000 mm/yr	400- 800 mm/yr	200-400 mm/yr	< 200 mm/year	2

Addition total of Qi. scores 13.0

Qii. Social. If any score is zero, total the previous scores only.

	0	2	4	8	16	Score
Social benefit	Dangerous, or totally unsuitable for the site	Hazardous, or outgrown most beneficial size	No special function or some problem characteristics	Special function; screen, flower, fruit, Landscape feature	Tree creates 'Sense of Place'	12
Form and features	Ugly and not interesting	Ordinary or plain	Attractive or interesting for part of the year	Attractive or interesting in all seasons	Superb , appealing specimen	8
Social Significance	Seldom seen	Seen frequently by private owners or adjacent residents	Seen by neighbour-hood residents or passers by	Known locally or seen by many passers by	Of local historical importance, or known widely	10

Addition total of Qii. scores 30.0

Physical and Social Qualities Factor = Qi. + Qii. Q **43.0**

SIGNIFICANCE INDEX (S x A x Q) 251

PLANTING COST (P) December

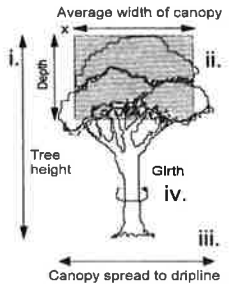
Average Landscape industry $ rate to supply & plant a 5 litre tree on local projects in 2015 $ P 26.60

TREE VALUE = S x A x Q x P **$ 6,674**

THYER TREE VALUATION WORKSHEET 2000b

File	NL_Inverell_140316		
DATE	Feb-16		
LOCATION	Otho Street Inverell	VALUER	Jacki Brown
SPECIES	Platanus x hybrida	Tree No	14

SIZE FACTOR (S) All measurements in metres



I. Height of tree	13.00		
		Calculations :	
ii. Area of canopy (side view)	108.00	ii Can. side area : Depth	9.00
Depth x Spread = 108		x aver. width	12.00
iii. Average diameter to dripline	12.00		
iv. Circumference of trunk (girth) at bh	1.57	Dbh	0.50
Dbh x pi = girth : 1.5715			

Size Factor : i. + ii. + iii. + iv. = 134.57 ÷ (10 + ii /100) S **12.15**

AGE FACTOR (A)

Age Factor : 0.02 x **20** (age of tree in years) + 0.5 A **0.90**

QUALITIES : PHYSICAL AND SOCIAL (Q)

Qi. Physical. If any score is zero, total the previous scores only and proceed to Qii.

	0	1	2	4	8	Score
Health	Dead or rapidly dying.	Surviving only. Treatment may help recovery	Damaged, diseased or restricted growth. Treatment will help	Normal growth and no recent damage	Thriving and no damage	3
Environmental benefit	Weed species	Restricts desirable plants or of little benefit to fauna	Beneficial to flora or fauna, provides food source, shelter	Remnant species of native vegetation	Indigenous species being integral part of native ecosystem	2
Life expectancy beyond present	0 - 5 years	5 - 20 years	20 - 50 years	50 - 100 years	> 100 years	3
Re-establishment potential of same species on site	Water required at planting time only	Three months maintenance required	Soil improvement and two year maint. required	Soil improvement, plant protection & ongoing maint. req.	Extremely difficult due to pollution, vandalism etc.	4
Rate of growth over first 10 years	> 2000 mm/year	800-2000 mm/yr	400- 800 mm/yr	200-400 mm/yr	< 200 mm/year	2

Addition total of Qi. scores 14.0

Qii. Social. If any score is zero, total the previous scores only.

	0	2	4	8	16	Score
Social benefit	Dangerous, or totally unsuitable for the site	Hazardous, or outgrown most beneficial size	No special function or some problem characteristics	Special function; screen, flower, fruit, Landscape feature	Tree creates 'Sense of Place'	12
Form and features	Ugly and not interesting	Ordinary or plain	Attractive or interesting for part of the year	Attractive or interesting in all seasons	Superb , appealing specimen	8
Social Significance	Seldom seen	Seen frequently by private owners or adjacent residents	Seen by neighbour-hood residents or passers by	Known locally or seen by many passers by	Of local historical importance, or known widely	10

Addition total of Qii. scores 30.0

Physical and Social Qualities Factor = Qi. + Qii. Q **44.0**

SIGNIFICANCE INDEX (S x A x Q) 481

PLANTING COST (P)

Average Landscape industry $ rate to supply & plant a 5 litre tree on local projects in December 2015 $ P 26.60

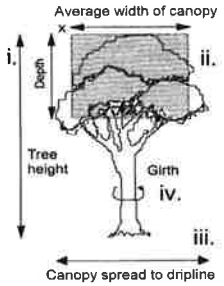
TREE VALUE = S x A x Q x P $ **12,793**

 with 2004 NSW LCA planting cost = $19.80

THYER TREE VALUATION WORKSHEET 2000b

File	NL_Inverell_140316		
DATE	Feb-16		
LOCATION	Otho Street Inverell	VALUER	Jacki Brown
SPECIES	Platanus x hybrida	Tree No	19

SIZE FACTOR (S) All measurements in metres



I. Height of tree	10.00		
ii. Area of canopy (side view)	108.00	Calculations : ii Can. side area : Depth	7.00
Depth x Spread = 49		x aver. width	7.00
iii. Average diameter to dripline	8.00		
iv. Circumference of trunk (girth) at bh	1.10	Dbh	0.35
Dbh x pi = girth : 1.10005			

Size Factor : i. + ii. + iii. + iv. = 127.10 ÷ (10 + ii /100) S **11.47**

AGE FACTOR (A)

Age Factor : 0.02 x **20** (age of tree in years) + 0.5 A **0.90**

QUALITIES : PHYSICAL AND SOCIAL (Q)

Qi. Physical. If any score is zero, total the previous scores only and proceed to Qii.

	0	1	2	4	8	Score
Health	Dead or rapidly dying.	Surviving only. Treatment may help recovery	Damaged, diseased or restricted growth. Treatment will help	Normal growth and no recent damage	Thriving and no damage	3
Environmental benefit	Weed species	Restricts desirable plants or of little benefit to fauna	Beneficial to flora or fauna, provides food source, shelter	Remnant species of native vegetation	Indigenous species being integral part of native ecosystem	2
Life expectancy beyond present	0 - 5 years	5 - 20 years	20 - 50 years	50 - 100 years	> 100 years	3
Re-establishment potential of same species on site	Water required at planting time only	Three months maintenance required	Soil improvement and two year maint. required	Soil improvement, plant protection & ongoing maint. req.	Extremely difficult due to pollution, vandalism etc.	4
Rate of growth over first 10 years	> 2000 mm/year	800-2000 mm/yr	400- 800 mm/yr	200-400 mm/yr	< 200 mm/year	2

Addition total of Qi. scores 14.0

Qii. Social. If any score is zero, total the previous scores only.

	0	2	4	8	16	Score
Social benefit	Dangerous, or totally unsuitable for the site	Hazardous, or outgrown most beneficial size	No special function or some problem characteristics	Special function; screen, flower, fruit, Landscape feature	Tree creates 'Sense of Place'	12
Form and features	Ugly and not interesting	Ordinary or plain	Attractive or interesting for part of the year	Attractive or interesting in all seasons	Superb , appealing specimen	8
Social Significance	Seldom seen	Seen frequently by private owners or adjacent residents	Seen by neighbour-hood residents or passers by	Known locally or seen by many passers by	Of local historical importance, or known widely	10

Addition total of Qii. scores 30.0

Physical and Social Qualities Factor = Qi. + Qii. Q **44.0**

SIGNIFICANCE INDEX (S x A x Q) 454

PLANTING COST (P)

Average Landscape industry $ rate to supply & plant a 5 litre tree on local projects in December 2015 $ P 26.60

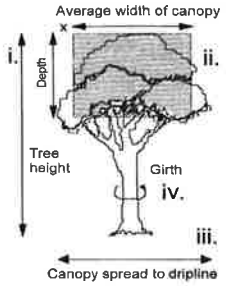
TREE VALUE = S x A x Q x P **$ 12,083**

 with 2004 NSW LCA planting cost = $19.80

THYER TREE VALUATION WORKSHEET 2000b

File	NL_Inverell_140316		
DATE	Feb-16		
LOCATION	Otho Street Inverell	VALUER	Jacki Brown
SPECIES	Platanus x hybrida	Tree No	55

SIZE FACTOR (S) All measurements in metres



I. Height of tree	10.00			
		Calculations :		
ii. Area of canopy (side view)	72.00	ii Can. side area : Depth	8.00	
Depth x Spread = 72		x aver. width	9.00	
iii. Average diameter to dripline	10.00			
iv. Circumference of trunk (girth) at bh	2.20	Dbh	0.70	
Dbh x pi = girth : 2.2001				

Size Factor : i. + ii. + iii. + iv. = 94.20 ÷ (10 + ii /100) S **8.79**

AGE FACTOR (A)

Age Factor : 0.02 x **50** (age of tree in years) + 0.5 A **1.50**

QUALITIES : PHYSICAL AND SOCIAL (Q)

Qi. Physical. If any score is zero, total the previous scores only and proceed to Qii.

	0	1	2	4	8	Score
Health	Dead or rapidly dying.	Surviving only. Treatment may help recovery	Damaged, diseased or restricted growth. Treatment will help	Normal growth and no recent damage	Thriving and no damage	3
Environmental benefit	Weed species	Restricts desirable plants or of little benefit to fauna	Beneficial to flora or fauna, provides food source, shelter	Remnant species of native vegetation	Indigenous species being integral part of native ecosystem	2
Life expectancy beyond present	0 - 5 years	5 - 20 years	20 - 50 years	50 - 100 years	> 100 years	4
Re-establishment potential of same species on site	Water required at planting time only	Three months maintenance required	Soil improvement and two year maint. required	Soil improvement, plant protection & ongoing maint. req.	Extremely difficult due to pollution, vandalism etc.	4
Rate of growth over first 10 years	> 2000 mm/year	800-2000 mm/yr	400- 800 mm/yr	200-400 mm/yr	< 200 mm/year	2

Addition total of Qi. scores 15.0

Qii. Social. If any score is zero, total the previous scores only.

	0	2	4	8	16	Score
Social benefit	Dangerous, or totally unsuitable for the site	Hazardous, or outgrown most beneficial size	No special function or some problem characteristics	Special function; screen, flower, fruit, Landscape feature	Tree creates 'Sense of Place'	12
Form and features	Ugly and not interesting	Ordinary or plain	Attractive or interesting for part of the year	Attractive or interesting in all seasons	Superb , appealing specimen	14
Social Significance	Seldom seen	Seen frequently by private owners or adjacent residents	Seen by neighbour-hood residents or passers by	Known locally or seen by many passers by	Of local historical importance, or known widely	12

Addition total of Qii. scores 38.0

Physical and Social Qualities Factor = Qi. + Qii. Q **53.0**

SIGNIFICANCE INDEX (S x A x Q) 699

PLANTING COST (P)

Average Landscape industry $ rate to supply & plant a 5 litre tree on local projects in December 2015 $ P 26.60

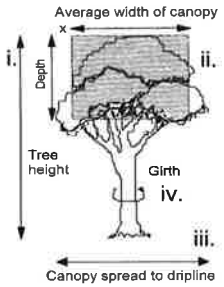
TREE VALUE = S x A x Q x P **$ 18,583**

 with 2004 NSW LCA planting cost = $19.80

THYER TREE VALUATION WORKSHEET 2000b

File	NL_Inverell_140316		
DATE	Feb-16		
LOCATION	Otho Street Inverell	VALUER	Jacki Brown
SPECIES	Platanus x hybrida	Tree No	31

SIZE FACTOR (S) All measurements in metres



I. Height of tree	11.00		
ii. Area of canopy (side view)	108.00	Calculations : ii Can. side area : Depth	6.00
Depth x Spread = 60		x aver. width	10.00
iii. Average diameter to dripline	12.00		
iv. Circumference of trunk (girth) at bh	0.94	Dbh	0.30
Dbh x pi = girth : 0.9429			

Size Factor : i. + ii. + iii. + iv. = 131.94 ÷ (10 + ii /100) S **11.91**

AGE FACTOR (A)

Age Factor : 0.02 x **20** (age of tree in years) + 0.5 A **0.90**

QUALITIES : PHYSICAL AND SOCIAL (Q)

Qi. Physical. If any score is zero, total the previous scores only and proceed to Qii.

	0	1	2	4	8	Score
Health	Dead or rapidly dying.	Surviving only. Treatment may help recovery	Damaged, diseased or restricted growth. Treatment will help	Normal growth and no recent damage	Thriving and no damage	3
Environmental benefit	Weed species	Restricts desirable plants or of little benefit to fauna	Beneficial to flora or fauna, provides food source, shelter	Remnant species of native vegetation	Indigenous species being integral part of native ecosystem	2
Life expectancy beyond present	0 - 5 years	5 - 20 years	20 - 50 years	50 - 100 years	> 100 years	3
Re-establishment potential of same species on site	Water required at planting time only	Three months maintenance required	Soil improvement and two year maint. required	Soil improvement, plant protection & ongoing maint. req.	Extremely difficult due to pollution, vandalism etc.	4
Rate of growth over first 10 years	> 2000 mm/year	800-2000 mm/yr	400- 800 mm/yr	200-400 mm/yr	< 200 mm/year	2

Addition total of Qi. scores 14.0

Qii. Social. If any score is zero, total the previous scores only.

	0	2	4	8	16	Score
Social benefit	Dangerous, or totally unsuitable for the site	Hazardous, or outgrown most beneficial size	No special function or some problem characteristics	Special function; screen, flower, fruit, Landscape feature	Tree creates 'Sense of Place'	12
Form and features	Ugly and not interesting	Ordinary or plain	Attractive or interesting for part of the year	Attractive or interesting in all seasons	Superb , appealing specimen	12
Social Significance	Seldom seen	Seen frequently by private owners or adjacent residents	Seen by neighbour-hood residents or passers by	Known locally or seen by many passers by	Of local historical importance, or known widely	12

Addition total of Qii. scores 36.0

Physical and Social Qualities Factor = Qi. + Qii. Q **50.0**

SIGNIFICANCE INDEX (S x A x Q) 536

PLANTING COST (P)

Average Landscape industry $ rate to supply & plant a 5 litre tree on local projects in December 2015 $ P 26.60

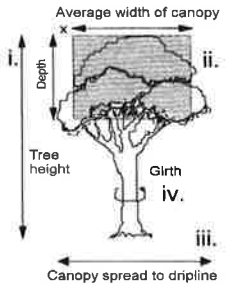
TREE VALUE = S x A x Q x P **$ 14,254**

 with 2004 NSW LCA planting cost = $19.80

THYER TREE VALUATION WORKSHEET 2000b

File	NL_Inverell_140316		
DATE	Feb-16		
LOCATION	Otho Street Inverell	VALUER	Jacki Brown
SPECIES	Platanus x hybrida	Tree No	47

SIZE FACTOR (S) All measurements in metres



I. Height of tree	7.00		
ii. Area of canopy (side view)	40.00	Calculations : ii Can. side area : Depth	5.00
Depth x Spread = 40		x aver. width	8.00
iii. Average diameter to dripline	8.00		
iv. Circumference of trunk (girth) at bh	1.89	Dbh	0.60
Dbh x pi = girth : 1.8858			

Size Factor : i. + ii. + iii. + iv. = 56.89 ÷ (10 + ii /100) S **5.47**

AGE FACTOR (A)

Age Factor : 0.02 x **65** (age of tree in years) + 0.5 A **1.80**

QUALITIES : PHYSICAL AND SOCIAL (Q)

Qi. Physical. If any score is zero, total the previous scores only and proceed to Qii.

	0	1	2	4	8	Score
Health	Dead or rapidly dying.	Surviving only. Treatment may help recovery	Damaged, diseased or restricted growth. Treatment will help	Normal growth and no recent damage	Thriving and no damage	3
Environmental benefit	Weed species	Restricts desirable plants or of little benefit to fauna	Beneficial to flora or fauna, provides food source, shelter	Remnant species of native vegetation	Indigenous species being integral part of native ecosystem	2
Life expectancy beyond present	0 - 5 years	5 - 20 years	20 - 50 years	50 - 100 years	> 100 years	3
Re-establishment potential of same species on site	Water required at planting time only	Three months maintenance required	Soil improvement and two year maint. required	Soil improvement, plant protection & ongoing maint. req.	Extremely difficult due to pollution, vandalism etc.	4
Rate of growth over first 10 years	> 2000 mm/year	800-2000 mm/yr	400- 800 mm/yr	200-400 mm/yr	< 200 mm/year	2

Addition total of Qi. scores 14.0

Qii. Social. If any score is zero, total the previous scores only.

	0	2	4	8	16	Score
Social benefit	Dangerous, or totally unsuitable for the site	Hazardous, or outgrown most beneficial size	No special function or some problem characteristics	Special function; screen, flower, fruit, Landscape feature	Tree creates 'Sense of Place'	14
Form and features	Ugly and not interesting	Ordinary or plain	Attractive or interesting for part of the year	Attractive or interesting in all seasons	Superb , appealing specimen	8
Social Significance	Seldom seen	Seen frequently by private owners or adjacent residents	Seen by neighbour-hood residents or passers by	Known locally or seen by many passers by	Of local historical importance, or known widely	10

Addition total of Qii. scores 32.0

Physical and Social Qualities Factor = Qi. + Qii. Q **46.0**

SIGNIFICANCE INDEX (S x A x Q) 453

PLANTING COST (P)

Average Landscape industry $ rate to supply & plant a 5 litre tree on local projects in December 2015 $ P 26.60

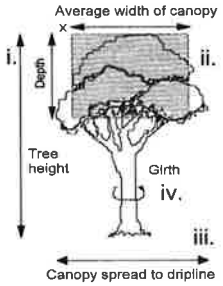
TREE VALUE = S x A x Q x P **$ 12,047**

 with 2004 NSW LCA planting cost = $19.80

THYER TREE VALUATION WORKSHEET 2000b

File	NL_Inverell_140316		
DATE	Feb-16		
VALUER	Jacki Brown		
LOCATION	Otho Street Inverell	Tree No	51
SPECIES	Platanus x hybrida		

SIZE FACTOR (S) All measurements in metres



I. Height of tree	12.00		
ii. Area of canopy (side view)	108.00	Calculations : ii Can. side area : Depth	9.00
Depth x Spread = 108		x aver. width	12.00
iii. Average diameter to dripline	12.00		
iv. Circumference of trunk (girth) at bh	3.46	Dbh	1.10
Dbh x pi = girth : 3.4573			

Size Factor : i. + ii. + iii. + iv. = 135.46 ÷ (10 + ii /100) S **12.23**

AGE FACTOR (A)

Age Factor : 0.02 x **65** (age of tree in years) + 0.5 A **1.80**

QUALITIES : PHYSICAL AND SOCIAL (Q)

Qi. Physical. If any score is zero, total the previous scores only and proceed to Qii.

	0	1	2	4	8	Score
Health	Dead or rapidly dying.	Surviving only. Treatment may help recovery	Damaged, diseased or restricted growth. Treatment will help	Normal growth and no recent damage	Thriving and no damage	3
Environmental benefit	Weed species	Restricts desirable plants or of little benefit to fauna	Beneficial to flora or fauna, provides food source, shelter	Remnant species of native vegetation	Indigenous species being integral part of native ecosystem	2
Life expectancy beyond present	0 - 5 years	5 - 20 years	20 - 50 years	50 - 100 years	> 100 years	3
Re-establishment potential of same species on site	Water required at planting time only	Three months maintenance required	Soil improvement and two year maint. required	Soil improvement, plant protection & ongoing maint. req.	Extremely difficult due to pollution, vandalism etc.	4
Rate of growth over first 10 years	> 2000 mm/year	800-2000 mm/yr	400- 800 mm/yr	200-400 mm/yr	< 200 mm/year	2

Addition total of Qi. scores 14.0

Qii. Social. If any score is zero, total the previous scores only.

	0	2	4	8	16	Score
Social benefit	Dangerous, or totally unsuitable for the site	Hazardous, or outgrown most beneficial size	No special function or some problem characteristics	Special function; screen, flower, fruit, Landscape feature	Tree creates 'Sense of Place'	16
Form and features	Ugly and not interesting	Ordinary or plain	Attractive or interesting for part of the year	Attractive or interesting in all seasons	Superb , appealing specimen	8
Social Significance	Seldom seen	Seen frequently by private owners or adjacent residents	Seen by neighbour-hood residents or passers by	Known locally or seen by many passers by	Of local historical importance, or known widely	12

Addition total of Qii. scores 36.0

Physical and Social Qualities Factor = Qi. + Qii. Q **50.0**

SIGNIFICANCE INDEX (S x A x Q) 1100

PLANTING COST (P)

Average Landscape industry $ rate to supply & plant a 5 litre tree on local projects in December 2015 $ P 26.60

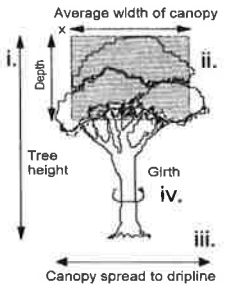
TREE VALUE = S x A x Q x P **$ 29,268**

 with 2004 NSW LCA planting cost = $19.80

THYER TREE VALUATION WORKSHEET 2000b

File	NL_Inverell_140316		
DATE	Feb-16		
LOCATION	Otho Street Inverell	VALUER	Jacki Brown
SPECIES	Platanus x hybrida	Tree No	**52 pre lop**

SIZE FACTOR (S) All measurements in metres



I. Height of tree: 12.00

ii. Area of canopy (side view): 108.00
Depth x Spread = 108

iii. Average diameter to dripline: 12.00

iv. Circumference of trunk (girth) at bh: 1.73
Dbh x pi = girth : 1.72865

Calculations :
ii Can. side area : Depth 9.00
x aver. width 12.00
Dbh 0.55

Size Factor : i. + ii. + iii. + iv. = 133.73 ÷ (10 + ii /100) S **12.07**

AGE FACTOR (A)

Age Factor : 0.02 x **20** (age of tree in years) + 0.5 A **0.90**

QUALITIES : PHYSICAL AND SOCIAL (Q)

Qi. Physical. If any score is zero, total the previous scores only and proceed to Qii.

	0	1	2	4	8	Score
Health	Dead or rapidly dying.	Surviving only. Treatment may help recovery	Damaged, diseased or restricted growth. Treatment will help	Normal growth and no recent damage	Thriving and no damage	3
Environmental benefit	Weed species	Restricts desirable plants or of little benefit to fauna	Beneficial to flora or fauna, provides food source, shelter	Remnant species of native vegetation	Indigenous species being integral part of native ecosystem	2
Life expectancy beyond present	0 - 5 years	5 - 20 years	20 - 50 years	50 - 100 years	> 100 years	3
Re-establishment potential of same species on site	Water required at planting time only	Three months maintenance required	Soil improvement and two year maint. required	Soil improvement, plant protection & ongoing maint. req.	Extremely difficult due to pollution, vandalism etc.	4
Rate of growth over first 10 years	> 2000 mm/year	800-2000 mm/yr	400- 800 mm/yr	200-400 mm/yr	< 200 mm/year	2

Addition total of Qi. scores 14.0

Qii. Social. If any score is zero, total the previous scores only.

	0	2	4	8	16	Score
Social benefit	Dangerous, or totally unsuitable for the site	Hazardous, or outgrown most beneficial size	No special function or some problem characteristics	Special function; screen, flower, fruit, Landscape feature	Tree creates 'Sense of Place'	14
Form and features	Ugly and not interesting	Ordinary or plain	Attractive or interesting for part of the year	Attractive or interesting in all seasons	Superb , appealing specimen	8
Social Significance	Seldom seen	Seen frequently by private owners or adjacent residents	Seen by neighbour-hood residents or passers by	Known locally or seen by many passers by	Of local historical importance, or known widely	12

Addition total of Qii. scores 34.0

Physical and Social Qualities Factor = Qi. + Qii. Q **48.0**

SIGNIFICANCE INDEX (S x A x Q) 521

PLANTING COST (P)

Average Landscape industry $ rate to supply & plant a 5 litre tree on local projects in December 2015 $ P 26.60

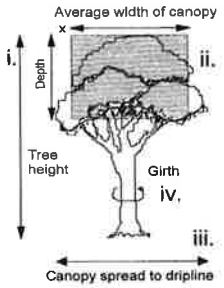
TREE VALUE = S x A x Q x P **$ 13,869**

 with 2004 NSW LCA planting cost = $19.80

THYER TREE VALUATION WORKSHEET 2000b

File	NL_Inverell_140316		
DATE	Feb-16		
LOCATION	Otho Street Inverell	VALUER	Jacki Brown
SPECIES	Platanus x hybrida	Tree No	**52 post lop**

SIZE FACTOR (S) All measurements in metres



I. Height of tree	7.00		
		Calculations :	
ii. Area of canopy (side view)	40.00	ii Can. side area : Depth	4.00
Depth x Spread = 40		x aver. width	10.00
iii. Average diameter to dripline	10.00		
iv. Circumference of trunk (girth) at bh	1.73	Dbh	0.55
Dbh x pi = girth : 1.72865			

Size Factor : i. + ii. + iii. + iv. = 58.73 ÷ (10 + ii /100) S **5.65**

AGE FACTOR (A)

Age Factor : 0.02 x **20** (age of tree in years) + 0.5 A **0.90**

QUALITIES : PHYSICAL AND SOCIAL (Q)

Qi. Physical. If any score is zero, total the previous scores only and proceed to Qii.

	0	1	2	4	8	Score
Health	Dead or rapidly dying.	Surviving only. Treatment may help recovery	Damaged, diseased or restricted growth. Treatment will help	Normal growth and no recent damage	Thriving and no damage	2
Environmental benefit	Weed species	Restricts desirable plants or of little benefit to fauna	Beneficial to flora or fauna, provides food source, shelter	Remnant species of native vegetation	Indigenous species being integral part of native ecosystem	2
Life expectancy beyond present	0 - 5 years	5 - 20 years	20 - 50 years	50 - 100 years	> 100 years	3
Re-establishment potential of same species on site	Water required at planting time only	Three months maintenance required	Soil improvement and two year maint. required	Soil improvement, plant protection & ongoing maint. req.	Extremely difficult due to pollution, vandalism etc.	4
Rate of growth over first 10 years	> 2000 mm/year	800-2000 mm/yr	400- 800 mm/yr	200-400 mm/yr	< 200 mm/year	2

Addition total of Qi. scores 13.0

Qii. Social. If any score is zero, total the previous scores only.

	0	2	4	8	16	Score
Social benefit	Dangerous, or totally unsuitable for the site	Hazardous, or outgrown most beneficial size	No special function or some problem characteristics	Special function; screen, flower, fruit, Landscape feature	Tree creates 'Sense of Place'	14
Form and features	Ugly and not interesting	Ordinary or plain	Attractive or interesting for part of the year	Attractive or interesting in all seasons	Superb , appealing specimen	8
Social Significance	Seldom seen	Seen frequently by private owners or adjacent residents	Seen by neighbour-hood residents or passers by	Known locally or seen by many passers by	Of local historical importance, or known widely	12

Addition total of Qii. scores 34.0

Physical and Social Qualities Factor = Qi. + Qii. Q **47.0**

SIGNIFICANCE INDEX (S x A x Q) 239

PLANTING COST (P)

Average Landscape industry $ rate to supply & plant a 5 litre tree on local projects in December 2015 $ P 26.60

TREE VALUE = S x A x Q x P **$ 6,354**

Factors Used in Existing AMENITY Tree Valuation Methods (generally for urban areas)

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Age
Amenity role / Interest / Attraction
Aesthetic value
Botanic interest
Canopy spread
Canopy volume
Compounded replacement cost
Condition of tree
Cost factor / $ value unit
Cost of maintenance required
Cost of small nursery stock
Cost to install small tree and maintain to size of previous tree
Cost to clean up damaged tree and site
Cost to repair tree damage
Cost to supply and install equivalent size tree
Danger caused by the tree
Diameter at breast height (DBH)
Endangered / rarity rating of the tree
Environmental benefit
Form
Frequency of observation
Frequency of occurrence of the species
Function / Screen / landscape feature
Girth
Growing space available
Height
Historical significance / association
Historical listing of the tree
Historical listing of land where the tree is growing
Importance in landscape / Impact
Land type / zoning, public, private, recreation etc
Land value
Land value increase / decrease
Likelihood of causing damage
Live crown size (width x height)
Location suitability
Market value of tree as a transplant
Nuisance / Detractions caused by the tree
Personal association
Presence of other trees
Price of nursery stock according to tree canopy volume
Price to supply and install nursery stock
Public access to the tree
Rate of growth
Re-establishment potential (difficulty of establishing new tree)
Relation to setting
Remnant of native vegetation
Site suitability
Size
Social benefit
Species
Stress the tree is enduring
Useful life expectancy beyond present
Vigour /Health / Damage
Visibility
Visual impact
Wildlife habitat
Value to owner / value to community

Others:

Factors that could be used in Amenity/General tree valuation methods

(Not forestry or crops)

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Air humidification
Air ionisation / de-ionisation
Barrier use, to provide safety and separation of pedestrians and cars etc
Biodiversity support
Carbon sequestration
Chemical air pollution absorption
Climate amelioration
Community 'willingness to pay' a method of polling the community to see how much each household would be willing to pay to keep the tree if it was threatened with removal, then adding up all the household amounts to get a value of the tree to that community
Emotional stress / fear (for people who do not like / are afraid of trees)
Emotional wellbeing (for people who feel happy when they see trees) tree change with season, flowers etc
Equivalent infrastructure, what cost of sculpture, artwork, shade structure, picnic shelter etc would be necessary to achieve similar benefits
Erosion control
Glare reduction
Habitat for beneficial animals / organisms
Habitat for birds, occurrence of birdsong
Improvement of soil and ground water condition
Infrastructure protection eg. Extended bitumen paving life in tree shade
Intrinsic value, just because they are
Noise reduction
Oxygen production
Particulate air pollution binding / absorption
Recreational use
Reduction of heat island effects
Reduction of soil salinity
Reduction of soil water logging
Reliability of performance, age, size etc
Road and urban visual indicator use, to mark town entry, bridges, residential streets, schools etc
Shade
Sick building (environment) syndrome remediation
Soil toxin uptake / neutralisation
Storm water capture and retardation
Summer shade / winter sun provision, degree of solar access when desired
Travel Cost method: How many people and how much are they willing to spend to visit a location because of the tree(s)
Urban forest honey production
Urban forest timber supply
UV reduction and reduced skin cancer risk
Water channel flow control, dispersion, turbulence
Wind shelter

Others:

Appendix IV – Current Tree Management Systems / Devices

Examples of suggested tree management systems and devices.

Permeable paving

'Ecotrihex' permeable pavers

'HyrdoSTON' permeable pavers

Terrabond or similar permeable asphalt

'Terrabond' or similar retrofit

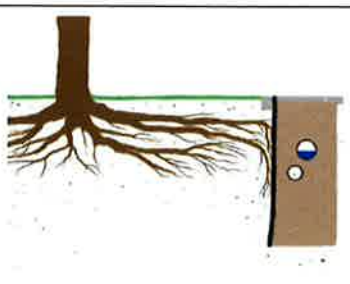
Pervious Concrete

Porous, flexible asphalt

Increased garden beds / openings in paving

(Metrogreen) underplanting in larger garden bed

Root barriers (should be installed along the edge of the asset being protected, not around the whole tree)



Structural underground cells for tree root zones and stormwater storage



Stratacell (Citygreen) around new tree plantings to provide sufficient soil volume below ground

Suspended pavements can involve soil cell systems or engineered piers

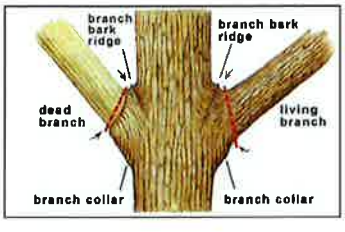
(Silvacell)

Water Sensitive Urban Design – "Rain gardens"



(Equatica) (Clearwater) (Geo-catch)

Pruning to AS4373



Tree roots being retained in situ during streetscape works

Other Tree Sensitive Urban Design methods:

- **Under-boring / directional drilling of services to avoid tree roots**
- **Pier and beam footings**
- **Structural soils**

Appendix V – Photographs

Tree 23 – at the time of assessment was in good health and condition, with minor paver uplift which could have been remediated by enlarging the opening in the paving, as has been done around the newly planted *Pyrus* trees.

Tree 23 – following removal of the tree (photo supplied by client).

Tree 19 – at the time of assessment was in good health and condition, with minor paver uplift which could have been remediated by enlarging the opening in the paving and replacing the kerb and gutter, as has been done around the newly planted *Pyrus* trees.

Tree 19 – following removal of the tree (photo supplied by client).

Trees 52 & 53 – had been topped (incorrectly pruned) at the time of assessment.

Trees valued at $6,354 each at this time, via Thyer Method of tree valuation.

Trees 52 & 53 – at a major entry point to Inverell, providing shade to pedestrians and vehicles, shown prior to topping (Source: *Google Streetview 2016*).

Trees estimated value of $13,869 each at this time, via Thyer Method of tree valuation.